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LEAFLETS

OF

PHILIPPINE BOTANY

Edited by A. D. E. ELMER, A. M.

Volume VIII, Articles 115-121,
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CONTENTS

Art.		Page
115	Two Hundred Twenty Six New Species—II, by *A. D. E. Elmer*	~~2917~~ 2719
116	Notes and Descriptions of Zingiberaceae, by *A. D. E. Elmer*	2885
117	Ascomycetes Philippinensis—VII, by *H. Rehm*	2921
118	Ascomycetes Philippinensis—VIII, by *H. Rehm*	2935
119	Zingiberaceae of the Sorsogon Peninsula, by *A. D. E. Elmer*	2963
120	Palms of the Philippine Islands, by *O. Beccari*	2997
121	New Woody Plants from Mount Maquiling, by *A. D. E. Elmer*	3069
	Frrata	3017
	Index	3109

LEAFLETS OF PHILIPPINE BOTANY

EDITED BY A. D. E. ELMER, A. M.

Vol. VIII. Manila, P. I., March 27, 1915. Art. 115.

Two Hundred Twenty Six New Species—II *

by

A. D. E. Elmer

LAURACEAE

Cryptocarya intermedia Elm. n. sp.

A medium sized tree; stem 3 dm thick, 12 m high, terete, straight, buttressed at the base, chiefly branched toward the top; wood moderately hard, dingy white, yellow in the center, a trifle bitter, odorless; bark smooth and brown, rather thick; main branches ascending, the ultimate ones dark green and numerous; twigs angular and fluted along their sides, the young tips densely brown puberulent or pulverulent. Leaves also numerous, alternate, subchartaceous, glabrous except the larger nerves beneath, dull green on the shallowly conduplicate surface, paler green beneath, brown on both sides when dry, the acute to subcuneate apex recurved, base broadly cuneate to obtuse, the average blades 13 cm long by 4 cm wide at the middle, elongated or the smaller ones broadly lanceolate; midrib very prominent and reddish brown when dry, usually puberulent or glabrate, shallowly sunken along the upper surface; lateral nerves of 4 to 6 alternating pairs, very oblique and almost straight, tips disappearing, other-

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Note,—Proof read by *Emma O. Elmer.*

* Continued from article 114.

wise like the midrib, cross bars few and relatively obscure, reticulations very fine and quite prominent under a lens from the nether side; petiole stout, 5 to 8 mm long, flat and shallowly grooved along the upper side, rusty tomentulose in the early state. Flowers not obtained. Infrutescence suberect, terminal or from the uppermost leaf axils, 1 to 2 dm long, paniculately branched; stalks on the dry specimens yellowish or grayish short tomentose, divaricately spreading, yellowish green when fresh, flexible, subterete; fruits few clustered toward the distal ends of the relatively short branchlets, shining dark green, subglobose or broadly ellipsoid, nearly 1.5 cm long, when dry almost black and appearing fine blistery, both the apex and the base grayish puberulent, usually 1-seeded; pedicels only a few mm long, subpersistent, densely hairy, stout.

Type specimen number 13648, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September, 1912.

Discovered this perplexing species on a steep densely wooded incline at 3950 feet elevation of Duros peak. "Maligting-mota" in Manobo.

Related to my mount Apo *Cryptocarya calelanensis* and to my mount Giting-giting *Cryptocarya glauciphylla;* neither is it *Cryptocarya palawanensis Merr.*

Cryptocarya laevigata Elm. n. sp.

A gnarly appearing tree; stem 5 dm thick, 10 m high, irregularly round, branched from below the middle; wood bitterish, isabellinus or dark oak color, murky dark brown toward the center; bark 2 cm thick, latericius except the smooth yellowish or grayish white and more or less densely lenticelled surface; main branches spreading, numerously rebranched, the ultimate ones green and ridged, the young tips brown puberulent at least when dry. Leaves pendant, shining lucid green on the upper surface and baked brown when dry, chalky white beneath even in the dry state, entire, numerous, alternate, glabrous, rigidly coriaceous, ovate to subelliptic, 14 cm long by one half as wide below the middle, apex very abruptly and narrowly acute, broadly obtuse to rounded at the base; petiole glabrate when old, 1 cm long, flattened along the upper side and grayish; midrib very prominent and yellowish beneath, impressed along the upper surface, very dark brown and obscurely puberulent beneath when dry; lateral nerves 2 to 3 on each side, the basal pair arising 5 mm from the base and ascendingly curved clear into the upper one third, the other nerves alternating and arising from and above the middle, also ascendingly curved and extending into the apical region, all tips becoming obsolete, cross bars faint. Flowers not observed. Infrutescence terminal or from the uppermost leaf axils, 1 dm long more or less, erect or suberect, very rigid, the larger ones paniculately few branched, the smaller ones very short branched and appearing spicate; the stalks angular, stout, greenish when young, rusty tomentose but wholly glabrous when old; fruits few clustered toward the distal ends of the ultimate stalks, upon 3 mm long comparatively thick and similarly pubescent pedicels, subglaucous green, hard, smooth, subglobose, the larger ones 1.5 cm thick, the basal portion usually more pointed than toward the apex, 1-seeded, very numerous.

Type specimen number 13604, *A. D. E. Elmer,* Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, August, 1912.

Upon a stony ridge of woods or forests strung with rattans and other climbing species at 3500 feet altitude and situated between Duros and Cawilanan peaks. The native or Manobo name is "Bonay."

Apparently related to *Beilschmedia trinervia Merr.* from the lake Lanao region. *C. V. Piper's* number 294 from Cabadbaran is the same as the Lanao material. Our species does not extend below 3500 feet altitude in our locality and upon close examination there are evident a number of distinctive characters.

Cryptocarya mindanaensis Elm. n. sp.

A middle sized tree; stem 7 m high, 2 dm thick, subterete; wood soft, yellowish white, light in weight, odorless and nearly tasteless; bark relatively thick, grayish brown lenticelled when old, yellowish on the inner side; branches spreading, freely rebranched; the twigs green or yellowish green, brown when dry, the young portion rusty tomentose. Leaves coriaceous or subchartaceous, shining and darker green above, curing deep brown though lighter brown beneath, copious, alternate, ascending or horizontal, glabrous above, finely pubescent beneath, entire, base broadly obtuse or rounded, apex abruptly acute to acuminate or merely obtuse and recurved, elliptic or elliptically elongated, quite variable in size, averaging 1 dm long by 4.5 cm wide at or a trifle below the middle; midrib prominent and reddish brown tomentose beneath, sunken along the upper side; lateral nerves about 5 pairs, ascending and slightly curved, also prominent and similarly tomentose beneath, tips reticulately united, the few cross bars relatively conspicuous, the reticulations much more obscure; petiole subterete, 5 to 8 mm long, tomentose. Flowers not seen. Infrutescence terminal or from the uppermost leaf axils, ascending or erect, 1 dm long or less, the larger ones paniculately few branched from below the middle, frequently appearing spicate or nearly so, the stalks yellowish green, in the dry state covered with a reddish brown tomentum; fruits upon short hairy pedicels or subsessile, short ellipsoid, shining dark green, 1.25 cm long, nearly 1 cm thick across the middle, at the base provided with a pubescent rim, exocarp thin, with a large single seed.

Type specimen number 13269, *A. D. E. Elmer,* Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, July, 1912.

In compact red ground of a forested ridge at 1000 feet above ocean level. "Biaon" is the Manobo native name.

Cryptocarya laurifolia (Blco.) Merr. or *Cryptocarya luzonensis Vid.* but our leaves are broader and more pubescent beneath and with very distinct cross bars.

Litsea bicolor Elm. n. sp.

Only a small upright tree; stem crooked but terete, 15 cm thick, 8 m high, branched at the top; wood rather soft, slightly bitter, odorless, yellowish; bark testaceus except the smooth and grayish mottled surface; main branches few, sparingly rebranched, long and very slender, spreading. Leaves in whorls 1.5 to 4 dm apart, mostly horizontal or descending, diverse in size, flat, subchartaceous, chalky white beneath except the dull yellow or fulvus midrib and lateral nerves, glabrous when old, sublucid above and grayish brown when dry, entire, broadly rounded and usually with a short blunt point at the apex, base broadly obtuse, elliptic or more commonly obovately elliptic, from 2 to 4 dm long without the stalk, 9 to 17 cm wide a trifle above the middle, the young leaves beneath brown hairy but soon becoming glabrous; midrib very stout beneath and in the early state dark tomentose, nearly flat on the upper side, brown on both sides; lateral nerves similar in color, about 9 on each side, ascending and gradually curved, relatively prominent on both sides, cross bars quite evident from beneath only, under a lens both surfaces but especially the upper side appearing very minutely reticulate; petiole 3 to 5 cm long, very thick and somewhat compressed, in the early state short fulvus tomentose, the upper side shallowly grooved and more nearly glabrous. Flowers not seen. Fruits clustered along the branchlets, upon short woody tubercles, ellipsoid, 1.25 to 2.25 cm long, turning from green to yellow and finally deep vermillion red; cups 1 to 1.25 cm across, flat, greenish, glabrous, persistent, constricted at the base, upon short and thick pedicels.

Type specimen number 13961, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, October, 1912.

Collected in humus covered soil among stones of deep woods in the Catangan creek gulch at 3000 feet above sea level. The Manobo name is "Hannag."

Litsea macrophylla Elm. n. sp.

A rather small and widely spreading tree; stem subterete, 4.5 dm thick, crooked, 12 m high, buttressed at the base, branched toward the top; wood very soft, without odor or taste, dingy or yellowish white except the musty nearly black central portion; bark thick, dark brown, densely lenticelled; limbs divaricately spreading, the basal ones long, sparingly rebranched, those toward the top rebranched; twigs thick and greenish, chain-like marked, glabrous. Leaves ascending, conduplicate, the obtusely rounded apex only slightly recurved, subglaucous green beneath, when dry even more white, the upper side curing brownish, a trifle inequilateral but the base very obliquely so, ovately elongated, 5 dm long by 2 dm wide below the middle, glabrous, the entire margins subinvolute in the dry state; midrib yellowish green, also glabrous, flat above, strongly raised beneath, turning black while drying; lateral nerves 19 to 23 pairs, pinnate, tips strongly ascending and almost disappearing, those of the upper nerves interarching, the minute reticulations obscure; petiole nearly 1 cm wide, black when dry, 1.5 cm from the base to the leaf base along one side, twice as long along the other side. Flowers not seen. Fruits densely clustered along the larger branches; stalks varying from 3 to 8 cm long, rigid, glabrous, greenish in the fresh state, bearing few fruits toward the distal ends; calyx cup shining deep green, constricted below the middle, subsessile, irregularly round, when dry radially rugose, margins appearing crenate, 2 cm across; nuts flatly globose, greenish white, becoming a trifle thicker than the calyx, shining and glabrous.

Type specimen number 13316, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, July, 1912.

Collected in rich soil of damp secondary forests at 500 feet altitude and near my headquarters. The Manobos called it "Pepay."

Distinguished from *Litsea gigantifolia Merr.* by having still larger leaves whose nether side is chalky white instead of yellowish, lateral nerves farther apart, widest below the middle, with an inequilateral oblique base, apex obtusely rounded not acute to acuminate.

Litsea urdanetensis Elm. n. sp.

Also a middle sized tree; stem nearly 6 dm thick, terete but somewhat crooked, 13 m high, chiefly branched toward the top, nearly straight; wood yellowish, slightly bitter, odorless, soft, only the thin sapwood whitish; bark thick, gray and brown mottled, smooth, flavus except the epidermis; branches spreading, crookedly rebranched, the ultimate ones slender and green, glabrous, striate, black when dry. Leaves alternate, ascending or horizontal, nearly flat, entire or margins coarsely wavy especially toward the bluntly pointed acute to obtuse apex, broadly cuneate toward the obtuse base, glabrous, elongated, thinly chartaceous, subglaucous green beneath, averaging 3 dm long by 1 dm wide across the middle or the widest portion, curing unequally green on the 2 sides; midrib ridged beneath, yellowish green yet nearly black in the dry state, plane and brown on the upper side; lateral nerves of 14 to 19 pinnate pairs, similar in color when fresh and when dry, less prominent than the midrib, tips ascendingly curved and gradually disappearing, cross bars faint, reticulations numerous and quite evident from both sides under a lens; petiole also glabrous, ascendingly curved, yellowish green, pure black when dry, subterete, narrowly grooved on the upper side, 1.75 cm long. Flowers solitary or 2 to 3-clustered, mainly from the leaf axils; peduncle about 1.25 cm long, ascending, yellowish green, puberulent, subtended by bract vestiges; buds globose, ashy gray; involucral bract thickly coriaceous, deeply concave on the upper side, glabrous, 5 to 7 mm long, about 5 mm wide across the middle, broadly elliptic, pulverulent or puberulent on the exterior, severally nerved, broadly rounded at the apex, spreading in full anthesis; flowers faintly odorous, few to 5-grouped in each head, also spreading; pedicel comparatively thick, 3 mm long, finely pubescent; perianth 3 mm long, 1 mm wide, narrowly oblong, membranous, glabrate and densely punctate, 7 or more in number, divaricate and wrinkled; fertile stamens about 8 or 9, with apparently 3 much shorter and sterile ones; filaments of the longer stamens filiform, strigose, curvingly spreading, 3 mm long, alternating with the perianth segments; anthers basifixed, introrse, 0.25 mm long, 0.6 mm wide, truncate at both ends, flattened, the 2 pairs of anther cells lateral and closed over with hanging lids, ovate to obovately oblong; style few mm long, thick, glabrous, bearing a capitate stigma.

Type specimen number 13427, *A. D. E. Elmer,* Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, August, 1912.

Collected in a wet forested flat at 500 feet above the sea. The Manobo vernacular name is "Dila-maok."

Critically related to *Litsea albayana Vid.*, *Litsea oblongifolia Merr.* and *Litsea ceasifolia Elm.*

Litsea velutina Elm. n. sp.

Quite a good sized tree; trunk 5 dm thick, terete, crooked, 14 m high, its first branches a little above the middle; wood soft, yellowish, odorless and tasteless, light in specific gravity; bark thick, smooth and dull brown on the surface, testaceus otherwise; main branches ascending and widely spreading, ultimately freely rebranched; branchlets dark brown, ascending, more or less angular and striate, dark brown puberulent. Leaves copious, persistent, opposite or subopposite, mostly horizontally spreading, coriaceous or subchartaceous, flat, shining deep green on the upper surface, paler or subglaucous green beneath, curing dark brown on the upper glabrous side, much lighter brown on the nether or subvelutinous side, very smooth, apex acute, base broadly obtuse, ovately elliptic or subelliptic, the velutinous brown covering on the under side disappearing in the old leaves and becoming chalky white beneath, the entire edges subinvolute in the dry state, the average ones 10 to 12 cm long and 4 to 5 cm wide across the middle or a trifle below it; midrib nearly flat above, light brown velvety covered in the early state, soon wearing glabrous, very prominent beneath; lateral nerves pinnate, parallel, almost straight, tips ascendingly curved and gradually disappearing, suboblique, cross bars rather numerous and relatively faint; petiole 5 to 8 mm long, drying blackish brown, pulverulent, thick especially toward the ascendingly curved base. Young inflorescence glomerated from the leaf axils, scarcely longer than 1 cm; bud pedicels 2 mm long, relatively very thick, deep rufus pubescent; involucral bracts 4, in 2 opposite pairs; the outer pair larger, arching over the inner pair though alternate with it, 2 mm long, short rufus pubescent on the exterior, spoon shaped, broadly oblong or elliptic, very thick and rigid; the inner pair also pubescent on the exposed surface, all 4 more or less united at the base; young flower clusters in 4, pubescent. Infrutescence from the axils of the leaf scars along the branchlets, ascending, few clustered, stalks very thick and short; fruiting cup green, 1 cm across the truncate apex, the same in length, stipitate at the base; young nuts darker green and with minute milk spots, when fully mature dark or deep red and shining, short ellipsoid, 1 cm in length, 1-seeded.

Type specimen number 14189, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, October, 1912.

Discovered this very distinct *Litsea* in damp stony ground of a forested incline at 5250 feet altitude and on the general route from lake Danao to the summit region of mount Urdaneta. Only one tree was detected. Its Manobo name is "Sungsung."

Persea pyriformis Elm. n. sp.

Only a small or middle sized tree; stem 3 dm thick, 8 m high, branched from the middle; wood soft and coarse, odorless and without taste, dingy white; bark thick, blackish brown on the densely checked epidermis, the central portion brown, the inner side white; main branches widely spreading and ultimately freely rebranched; the twigs green and smooth, terete, turning almost black while drying, rather slender. Leaves descending, curvingly folded upon the upper darker green surface, thinly coriaceous, subglaucous green beneath, opposite or subopposite, glabrous, well scattered, exceedingly variable in size, the abruptly and sharply acute point recurved and frequently subfalcate, base broadly obtuse or rounded, entire margins subinvolute in the dry state, oblong or ovately oblong, 1 to 2 dm long by 4 to 9 cm wide at the middle; petiole 1 to 2 cm long, blackish brown, glabrous, caniculate, comparatively slender; midrib raised beneath, smooth, reddish brown when dry; lateral nerves 3 on each side whether of small or large blades, the basal pair arising 5 mm from the base and running nearly parallel with the leaf edge, the others arising from above the middle, also much ascending, their tips more or less interarching, cross bars also evident, reticulations fine. Flowers not seen. Fruits upon 3 cm to 1.5 dm long stalks or spikes, from the leaf axils, usually solitary though occasionally few clustered toward the distal end, hard, shining green, elongated and pear shaped, 8 cm long and nearly one half as thick toward the distal end, terete, with a large similarly shaped yellowish seed; pedicels 1 cm long or shorter, thick, expanded at the end, subterete, subpersistent.

Type specimen number 13311, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, July, 1912.

Standing among dense woods on the gravelly banks of the Catangan creek at 1000 feet altitude. "Hotot" is the Manobo name.

Persea surigaoensis Elm. n. sp.

A slender and erect tree; stem 2.5 dm thick, 10 m high, terete, mainly branched toward the top; wood odorless and without taste, soft, yellowish tinged except the light yellow heartwood; bark smooth, yellowish or gray toward the branches, latericius except the surface; branches divaricate, rather long and crookedly rebranched towards their ends; the twigs glabrous, roughened with lenticels, subterete, ascendingly curved. Leaves alternate, chartaceous, ascending, glabrous, similarly brown on both sides when dry, entire, the nether side much lighter green in the fresh state, apex broadly rounded except the abruptly short acute and recurved point, base cuneate, obovately elongated, 3 to 4 dm long by 14 cm wide above the middle, frequently becoming much reduced; midrib very pronounced beneath, plane above, yellowish but brown when dry; lateral nerves very similar, composed of 11 to 13 pairs, ascending, nearly straight, tips of the upper ones much curved and interarching, the coarse cross bars relatively prominent, the secondary cross bars and intervening reticulations also evident; petiole about 2 cm long and 5 mm thick, terete, upwardly curved, glabrous. Panicle arising from the uppermost leaf axils, erect, 1 to 2 dm long, when solitary branched from below the middle, or with 3 stalks from the base and of which the middle one is the longer; branches ascending alternate, green; bark turning reddish brown on the exposed side, in the dry state appearing compressed, rebranched from above the middle, the younger ones latericius short tomentose; buds umbellately clustered toward the distal ends of the branchlets, subtended by small similarly tomentose and caducous bracts; flowers in anthesis ochroleucus, when old dull purpureus, all stages of development on the same inflorescence and thereby variously colored; strict pedicel 3 mm long, short fulvus pubescent, subtended by thick acute bracts covered with similar hairs; outer series of perianth segments 3, brown strigose on the outside, 1.5 mm long, ovate, clearly punctate, rigid; the inner series of 3 segments alternating with the outer series, all united, at the base broadly ovate, at least 2 mm long, less pubescent on the outside, also punctate; stamens apparently sterile, forming a thick cartilaginous more or less hairy rim; the sessile or nearly sessile anthers introrse, apparently minutely 4-celled; pistil well developed, 1.5 mm long, glabrous; ovary ovoidly ellipsoid, style very short, stigma expanded.

Type specimen number 14027, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, October, 1912.

Gathered in loose more or less stony ground deeply covered with humus of a densely shaded or forested depression along the Catangan creek at 3000 feet altitude. Only one tree was found and my Manobo cargadore called it "Pamoteon."

Only distantly related to my *Persea leytensis* and it may possibly belong to the genus *Cryptocarya*. This same species has previously been collected at Placer and on Dinagat island of Surigao province by *Sr. J. F. Quadras* in the year of 1901. I was wrong in referring the Surigao specimens under *Persea leytensis Elm.* on page 384 of this publication.

LECYTHIDACEAE

Barringtonia gitingense Elm. n. sp.

Slender erect tree; stem 2.5 dm thick, terete, branched above the middle; wood dirty yellow, odorless, bitterish, moderately hard and heavy; bark thick, dull gray, the epidermis scaling in relatively thick but small plates; branches gnarly, spreading, crookedly rebranched, the tough and glabrous twigs suberect. Leaves ascending, alternatingly crowded toward the ends of the branchlets, rigidly coriaceous, glabrous, sublucid on the upper folded surface, slightly recurved toward the acuminate point, the entire margins minutely involute, more or less wavy and curved upon the nether side, base subattenuate or cuneate, drying dull caesius, exceedingly variable in size, the average blades 2 dm long by 6 cm wide at the middle, occasionally larger, frequently much smaller, lanceolately oblong, leaving large conspicuous scars after falling; midvein pronounced beneath, finely ridged on the upper side; primary lateral nerves 9 to 13 pairs though frequently interspersed with secondary ones, divaricate, also prominent from both sides, their tips usually interarching and somewhat reticulately branched, reticulations numerous and bold from both surfaces; petiole glabrous, 5 to 8 cm long, angular and flattened on the upper side, thickened and blackish at the base in the dry state, brown when fresh; bud bract glabrous, acuminate, 7.5 mm long. Inflorescence terminal, pendulous, 1 m long or less; rachis tough, terete, glabrous, longitudinally striate, less than 1 cm thick, when dry much thinner, solitary; flowers deciduous, heavy, sessilely scattered along the spike, divaricate, with a faint disagreeable odor; calyx green, 1 cm long, the basal one half or more angular and gradually thickened toward the top; segments persistent, 4, broadly rounded or obtuse; petals of the same number, caducous, greenish white, succulent, oblong, 2.5 cm long, nearly 1 cm wide, glabrous; filaments yellowish white, very numerous, the basal portion straight and at the base united and adnate upon the corolla, purlish red toward the apex and interlaced, 3 to 4 cm long; anther yellow, ovately ellipsoid, 1 mm long; style persistent, reddish except the greenish basal portion, filiform, much exceeding the stamens and usually recurved; stigma slightly enlarged, green or greenish.

Type specimen number 12236, *A. D. E. Elmer*, Magallanes (Mt. Giting-giting), Island of Sibuyan, April, 1910.

Standing in good moist soil of woods or forests at 700 feet above sea level. The Visayan of northern Sibuyan call it "Magopaho."

This species was distributed as *Barringtonia revoluta Merr.* of Palawan and of which I more recently collected typical specimens in the type locality. It is distinctly different from *Merrill's* species and seems to run closely to *Barringtonia sumatrana Miq.*

LEGUMINOSAE

Dalbergia dubia Elm. n. sp.

A tough forest tree climber; stem 3.5 cm thick toward the rebranched top; branches wiry, brown and yellowish gray lenticelled; twigs relatively short, horizontally spreading, when young or along the lower or protected side densely testaceus puberulent, the older or more exposed portion smooth or glaucous gray. Leaves entire, alternating along the ultimate branches, subsessile or very short stalked, ascending, varying from 5 to 10 cm long, 15 to 31-imparipinnate; rachis subolivaceus tomentulose, leaflet bearing from near the base; leaflets also ascending, membranous, flat, paler green beneath, subopposite, oblong except the terminal one which is obovately elongated, curing lighter brown beneath, yellowish strigose on both sides especially on the lower side, varying from 1 to 2 cm in length and from 5 to 8 mm in width, truncately rounded and subemarginate at the apex, base obliquely rounded, inequilateral below the middle; midrib conspicuous beneath and olivaceus hairy, plane along the upper side, lateral nerves and minute reticulations obscure. Inflorescence paniculate, terminal, ascendingly curved, branchlets 6 to 9 cm long or much shorter, relatively narrower across the base; main branches alternatingly branched from below the middle, short testaceus tomentose; their branchlets slender, unbranched, bearing flowers from near the base. Flowers yellowish green, caducous, quite rigid, buds green, all subtended by green and subpersistent bracts; pedicel nearly 2 mm long, pulverulent, subtended by a broadly rounded persistent puberulent bract; calyx 5 mm long, almost 3 mm thick toward the top, dark brown when dry, glabrous, at the base subtended by a pair of leathery broadly elliptic 2 mm long puberulent bracts, uniqually and bluntly 5-toothed across the truncate apex; petals glabrous, 7.5 mm long, very slenderly clawed below the middle, inserted upon the basal portion of the calyx; banner erect and much recurved, the lamina portion broad and irregularly 3-notched across the broad apex, truncate and subauriculate at the base, sides rolled upon the ventral surface; wings and keels not very unlike, the lamina portion oblong, with the widest portion toward the broadly rounded or subtruncate apex, at the base auriculately lobed, rather straight, like the banner more or less veiny; stamens 6 mm long, tubular, straight, 1.25 mm thick, entirely glabrous, 10-ridged, only the apical 1.5 mm long portion free and ascendingly curved; anthers very small, terminal, basifixed, apparently notched at both ends; stipe very slender, glabrous, 1 to 1.5 cm long; ovary about as long, 3 mm wide, very flat or rather thin, tapering toward the stipe, apex obtuse and terminated by the 1 mm long style, about 3-ovuled.

Type specimen number 13733, *A. D. E. Elmer*, Cadbadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September, 1912.

This liana was found on a wind swept forested ridge at 3500 feet of Duros peak. Manobos call it "Ticosmayadon."

Related to a number of species but especially to *Dalbergia pinnata Lour.* and to *Dalbergia tamarindifolia Roxb.* The former species *Dr. Col. Prain* in his monograph refers to *Dalbergia millettii Benth.*

Derris surigaoensis Elm. n. sp.

A climbing and sprawling shrub; stem bendable, terete, 2 5 cm thick, chiefly branched at the top; wood white, very soft, odorless and without taste; bark smoothish, greenish brown, yellowish in the middle, nearly white on the inner side; branches green, light brown lenticelled, terete, glabrous, slender and dropping, the ultimate ones relatively short. Leaves alternate, horizontal, somewhat paler beneath, chartaceous when old, the abruptly acute to acuminate apex strongly recurved, drying light gray to brownish beneath and greenish on the upper side, glabrous, entire margins subinvolute in the dry state, obtusely rounded and occasionally slightly inequilateral at the base, elliptically elongated or suboblong, variable in size, the average blades 1 dm long by 4 cm wide at or above the base, 3 to 5-foliate, the terminal leaflet considerably larger; petiole with the rachis 1 dm long or longer, green, glabrous, subterete and minutely caniculate along the upper side, the petiole base much thickened and drying blackish brown, the rachis extended 1.25 to 2 cm beyond the upper pair of lateral leaflets; petiolule 4 to 7 mm long, thick, deep brown in the dry specimens; midrib stout beneath, little sunken along the upper surface, stramineus when dry; lateral nerves ascendingly curved, obscure, about 5 to 8 pairs, reticulations very fine, similarly prominent on both sides,. Inflorescence suberect, terminal or subterminal, 1 to 4 dm long; branches alternate, few, rather slender, green and glabrous, spicate or with only very short lateral branchlets, striate or becoming angular, ascendingly curved; flower bearing branchlets alternatingly scattered from near the base, 1 to 2 cm long, slender; pedicels 5 mm long, few and alternatingly scattered from the middle, very slender, divaricate, subtended by bract vestiges, glabrate or only sparsely short hairy; calyx 3.5 mm long, as wide across the slightly obliquely truncate and minutely ciliate apex, rounded at the base, glabrous, longitudinally marked with whitish striae; banner 12.5 mm long, broad and truncately rounded at the lamina base and constricted into a 2 mm long narrow claw, the hyaline side folded and in the upper region with elongated spots, apex rounded and shallowly emarginate, with numerous veins, 8 mm wide; wings 1 cm long, the basal 3 mm clawed, the lower side nearly straight and contiguous in the early state, the upper edge minutely undulate and lobulate at the base, rounded at the apex, veiny and with greenish elongated striae in the upper region, hyaline; keels as long, similar in texture and markings, the lower edge nearly straight and contiguous along the middle or above it, 3 mm wide, broadly rounded at the apex, the base of the lamina with a tooth-like lobe and with a 1.5 mm long claw, also veiny; stamens 1.25 cm long, 10, united into a glabrous tube 2 mm thick at the base and with an excrescence on the upper side near the base, the curved portion open; free portion of the filaments ascendingly curved, all glabrous; anthers broadly elliptic, 0.66 mm long, basifixed, laterally dehiscent; ovary 1.25 cm long, subcompressed, widest a trifle below the middle, strigose except the ascendingly curved glabrous neck; stigma minute.

Type specimen number 13493, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, August, 1912.

Covering dense thickets and woods on wet rocky banks of the Catangan creek at 1000 feet altitude. The Manobo name for it is "Bagodon-ihanon."

Not *Derris philippinensis Merr.* which is based upon 11262 *Cuming.* Neither is it *Dr. Perkins*' Philippine species *Derris mindorensis* or *Derris micans.*

Cynometra copelandii Elm. n. comb. *Gleditschia copelandii Elm.* Leaf. Philip. Bot. II, 695, 1910.

Cynometra whitfordii Elm. n. sp.

A very small and upright tree; stem terete, 1 dm thick, 5 m high, branched from below the middle; wood reddish brown, quite hard, odorless and tasteless; bark nearly smooth, atropurpureus except the mottled epidermis; branches divaricate, repeatedly branched and horizontally spreading; the ultimate ones crooked, relatively short, terete, rigid and tough, the young tips tawny puberulent though soon becoming glabrous. Leaves alternate, the terminal ones appearing opposite, bijugate and in the early state with a pair of small opposite pair of leaflets from the base; terminal pair of leaflets sessile, ascending, subchartaceous, much paler beneath, ultimately glabrous, the recurved apex abruptly acute to acuminate, at the blunt point deeply notched and its lobes rounded, obtuse at the base and inequilateral, oblong, equal in size and shape or only seldom unequal, the inner side narrower and straight toward the base, the average ones 1 dm long by 4 cm wide across the middle or its widest portion, entire, curing nearly equally brown on both sides; the basal pair of leaflets usually unequal in size, broadly elliptic, also sessile, 8 to 20 mm long, ultimately falling, rounded and oblique at the base, broadly obtuse and minutely notched at the apex, otherwise quite similar to the other pair of leaflets; midrib prominent beneath, usually with strigose hairs along its sides toward the base, plane above; lateral nerves subdivaricate or ascending and straight, 5 to 9 on each side and with intervening secondary ones, reticulately united toward their ends, reticulations quite evident from both sides; rachis 1 to 1.5 cm long, rather densely yellowish brown pubescent, caniculate along the upper side. Flowers in small groups, axillary or rather opposite the terminal leaf, erect, upon a short common stalk which is densely bracteate at the base; pedicel 1 mm thick, averaging 4 mm long, yellowish pubescent, strict, subtended by a whorl of deciduous bracts; outer bracts ovate, 2.5 mm long, as wide across the truncate base, strongly folded about the base of the pedicel, coriaceous or brown and subchartaceous in the dry state at least, 2-cleft, the acute apices terminating into subcallous points, finely puberulent on the dorsal side, the inner 2 bracts free or nearly so, almost 2 mm in length, strongly folded, oblong to broadly lanceolate, glabrous except the keel above the middle and along the margins; corolla spreading from the distal end of the pedicel, brown when dry, membranous, 2.5 mm long, irregularly divided but all of the 5 segments of equal length, glabrous, reflexed and persistent after anthesis, the broader one 2 mm wide and elliptically oblong, the narrower ones less than one half as wide and linear; stamens about 10, two thirds of them fertile, the others sterile; staminodes nearly 4 mm long, membranous, lanceolate, 0.75 mm wide at the middle, sharply pointed at the apex, the midrib quite prominent and glabrous; filaments varying from 1.5 to 4 mm long, also glabrous, coriaceous, subterete, more erect than the spreading staminodes; anther 1 mm long, subbasifixed, compressed, ovately elliptic from the side view, notched at the apex, laterally dehiscent; ovary compressed, cuneate or short stipitate at the base, 2 mm long, the basal portion provided with long yellowish hairs, strongly bulged above the middle; style as long, terete, fleshy, glabrous, ascending, terminated by a minute stigma. Young pod erect, much compressed, rather thick and hard, lune shaped.

Type specimen number 13465, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, August, 1912.

Collected in very damp humus covered soil mixed with bowlders of a densely forested flat near the Catangan creek at 1250 feet altitude. "Cato-cabinganan" is the Manobo name. Dedicated to *Dr. H. N. Whitford*, formerly economic and scientific forester of the Philippine government.

Clearly related to *Cynometra bijuga Span* and apparently distinct from its varieties.

Mucuna macmillani Elm. n. sp.

A lofty tree climber or liana; stem 8 cm thick, terete, very crooked and twining, mainly branched toward the top; stem tissues nearly herbaceous, porous, divided into five reddish and five yellowish white alternating concentric zones, the reddish portion freely bleeding with an incarnatus or purpureus juice, quite odorless and tasteless; branches long and rope-like, hanging from the tree tops over the creek bed or spanning it entirely; the ultimate ones green, terete, glabrous, tough, drying brown and minutely striate. Leaves divaricate, widely scattering, alternate, trifoliate; petiole 1 dm long or less, glabrous, terete, the basal portion much thickened and twistingly curved, 3 cm extended beyond the lateral pair of leaflets, blackish brown in the dry state; petiolule 1 cm long, thick, black when dry, occasionally subglaucous and usually puberulent; the interstipular bracts diverse, linear or laciniately lobed, those from the petiolules much reduced; lateral leaflets ovate in general outline, abruptly and narrowly acuminate, tips strongly recurved, base very broad and truncately rounded, quite unsymmetric, the outer side twice as broad as the nearly straight inner side and broadly rounded below and toward the base, mostly descending, coriaceous, paler green beneath, nearly flat, curing dark brown on both sides, glabrous, the larger ones 18 cm long by one half as wide below the middle, entire; the terminal leaflet symmetric, equal in size, base broadly obtuse to obtusely rounded; midrib conspicuous beneath, straight in the lateral leaflets; lateral nerves 5 to 7 pairs, plane above and like the midrib conspicuous beneath, ascending especially the basal pair, the outer basal nerve 3 to 5-branched along its lower side, the next above it fewer branched and the third one merely forked, cross bars few and faint. Peduncle green, thread-like or wiry, glabrous, quite strong and elastic, axillary, 3 to 7 m long, at the end corymbosely paniculate; branchlets 1 to 3 dm across, thick, alternatingly rebranched, the ultimate ones rather numerous, striate or roundly angular, short velvety brown tomentose, subtended by glabrous scars of fallen bracts; buds pale green or yellowish tinged, when dry appearing dark velvety, also short tomentose, ellipsoid, 1.5 cm long, one half as thick across the middle, the abruptly apical point tipped, sessile and solitary from the end of the compressed 1 to 1.5 cm long pedicel, subtended by a pair of bracts; caducous bracts leathery, 5 to 8 mm long, oblong, similarly tomentose; calyx a flattened cup, thick and rigid, on the outside densely covered with a velvety brown puberulence, 2 cm long, nearly as wide, the truncate throat somewhat oblique by the extention of the lower one half which usually bears 3 blunt points, the middle one of which is the largest; corolla fleshy, pale sulphureus when fresh, turning black while drying, glabrous; banner 4.5 cm long, auriculately constricted at the base into a 5 mm long claw, apex broadly rounded, the lamina elliptic and more or less folded upon the ventral side; the wings 7.5 cm long, the lamina 5.5 cm long by 1 cm wide at least, obtusely rounded at the apex, the basal 2 cm claw-like and dense hairy upon the under side; keel as long as the wings, the distal 5 cm divided into 7.5 mm wide lobes of which the apical 1 cm is distinctly upwardly curved, obtusely terminated; stamens 9, about 4 cm long, glabrous, the basal two thirds united into a broad straight tube, the apical one third free and ascending; filament subequal in length, the upper ones longer, free toward the base, flattened; anthers basifixed or nearly so, the 2 lateral ones 3 mm long, 2 mm wide across the upper portion, notched or sinuately lobed at the hairy apex, base much narrower and obtuse; the other anthers glabrous, 1 mm longer, 1.5 mm wide throughout, emarginate at the apex, truncate at the base; ovary subterete, short velvety pubescent, 1.5 cm long; style very slender, glabrous, 4 cm long, the stigmatic portion thickened and terminated by an evident point.

Type specimen number 13594, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, August, 1912.

Discovered along the rocky forested banks of the Catangan creek at 1500 feet elevation. Named with pleasure after *Mr. Clyde MacMillan*, the supervising American teacher at Cabadbaran who has shown me many favors which were highly appreciated. The Monobos call it "Bunalan."

Chiefly differs from my number 6233 or the type of *Mucuna longipedunculata Merr.* in having only one half as large bracts which with the pedicels and calyces are more densely covered with a dark velvety brown tomentose not cinereous or subglabrous. There are other minor differences in the flowers and leaves.

Along this same creek in the densely forested flats there is another very distinct species of *Mucuna* which I failed to get even after making quite a clearing. Flowers of it were often seen on the ground and whose corollas were scarcely any longer than wide, were of the same creamy white color when fresh and turning deep black while withering and becoming dry.

Strongylodon agusanensis Elm. n. sp.

A looping woody climber or liana; stems very flexible, 3 cm thick, subterete, twining and twisting, with very soft greenish wood and a large whitish pith; bark greenish and gray blotched, more or less brown lenticelled; twigs glabrous, terete, greenish but turning brown when dry, the slender ones hanging, tough. Leaves horizontal, alternatingly scattered; petiole ascendingly curved, also glabrous, similar in color to the twigs in the fresh as well as in the dry state, 9 to 13 cm long, subterete, curved and somewhat thickened at the base, subpersistent; petiolule darker green, 5 to 7 mm long, thick, grooved along the upper side, curing yellowish, articulate at the base and easily separating at that point, the petiole extended 6 mm above the lateral pair of leaflets; blades trifoliate, subcoriaceous, curing greenish to brown on both sides, entire, 10 to 14 cm long by one half as wide relatively; lateral pair very unequilateral, abruptly acute at the apex, base truncately rounded; the terminal leaflet symmetric, similar at the apex, broadly cuneate toward and at the basal point rounded; midrib glabrous, pronounced beneath, stramineus when dry, finely ridged along the upper side; lateral nerves 5 to 7 pairs, similar in prominence and color, ascending, nearly straight, tips strongly curved, basal pair of the terminal leaflet parallel with the edge of the leaf, cross bars evident, reticulations minute; stipules adnate, thick, oblongish, 5 mm long. Inflorescence lateral, divaricate; rigid spikes 5 to 20 cm long, subterete, glabrate, more or less striate and short bracteate at the base, flower bearing above the middle; very young apical bud bracts oval, strongly ridged; flowers 3 to 5-clustered from 3 to 5 mm long stout branchlets, odorless, deciduous, atrocyaneus especially the calyx; buds subterete, nearly straight, upon slender glabrous 1 cm long pedicels; calyx 7 mm long, 5 mm wide across the truncate top, somewhat narrowed at the base, subterete, glabrous, with many parallel purple veins which toward the top is cross nerved; banner 3 cm long, broadly lanceolate, 1 cm wide across the middle, apex rounded, basal portion gradually clawed, sides more or less folded upon the ventral side and rugose below the middle, erect or reflexed from below the middle, glabrous, every part of it conspicuously streaked with purple; wings 1.75 cm long, 7 mm wide across the broadly rounded upwardly extending

apex, the upper side lobulate at the base of the lamina, abruptly constricted into an 8 mm long very narrow claw, also glabrous and similarly streaked; keel 3.5 cm long, the 2.5 cm long by 1.5 cm wide lamina portion broadly lanceolate, slenderly acute and ascendingly curved toward the apex, the ventrally folded sides terminated at the base by a blunt point and abruptly extended into a 1 cm long claw, quite membranous, glabrous, purple streaked; stamineal tube enclosed by the keel, equalling it in length, glabrous; the free filaments one half as long, purple; anthers 1 mm long, twice as wide across the base than at the apex, basifixed; stipe 6 mm long, puberulent; ovary compressed, less in length, 5-ovuled, its thread-like neck nearly 3 cm long; stigma very small, terminal.

Type specimen number 13461, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, August, 1912.

Rooted in wet stony ground and climbing with other vines along a tree trunk partly extending over the dry Catangan creek bed at about 750 feet elevation. In Manobo "Panidehidon."

The flower bearing spikes are much shorter, flowers larger and individual parts differently shaped than in *Strongylodon mindanaensis Elm.* More distantly related to *Strongylodon pulcher C. B. Rob.*

LILIACEAE

Smilax reticulata Elm. n. sp.

A sprawling and climbing vine; stem 1 cm thick, greenish, rigid and wiry, occasionally branched, the free portion hanging, terete, the young twigs glabrous. Leaves pendant or descending, widely scattering, alternate or arising from the point of branching, the everage blades 16 cm long by one half as wide below the middle, ovately oblong or ovately elliptic, the smaller ones elongated, conduplicate at the broadly rounded base and at the abruptly rounded callously thickened acute apex, entire, glabrous, shining on both sides and drying similarly brown, thinly chartaceous; veins 3, the middle ones straight and stouter, reddish brown and smooth when dry, dull yellow, the lateral pair arising a few mm from the base and extending clear into the apex, reticulations very plain on both sides, forming a faint submarginal line; petiole 2 cm long, very thick and much ascendingly curved, drying blackish, subterete, narrowly grooved on the upper side toward the distal end, at the base surrounded by a rigid glabrous 1 cm long or longer booted bract obscurely reticulated toward the distal end, dull red in the fresh state; its stipules usually developed into a pair of tendrils. Infrutescence axillary, 5 to 8 cm long, usually only one peduncle arising from the booted persistent bract, few branched from below the middle; branchlets alternate, chiefly from about the same region, as long or longer than the peduncle proper, subtended by coriaceous glabrous bracts, somewhat compressed and striate, glabrous, curing brown; receptacle 4 to 7 mm in diameter, flatly globose, glabrous, coarsely pitted; pedicels slender, strict, 1.5 cm in length, glabrous, terete, thickened at both ends, spreading on all sides, falling with the fruit; fruit nearly sulphureus, hard and shining, flatly globose and terminally apiculate, 1 cm in diameter.

Type specimen number 13684, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September, 1912.

Upon a jungled ridge in a humid depression between Duros and Cawilanan peaks at 3500 feet altitude.

Distinguish from *Smilax williamsii Merr.* in having larger leaves with one pair less of lateral nerves and with terete and perfectly smooth stems. It is more distantly related to *Smilax bracteata Presl.*

LOGANIACEAE

Fagraea congestiflora Elm. n. sp.

Very slender tree; stem terete, straight, 1 dm thick, 8 m high; wood bitterish, odorless, moderately hard and heavy, the sapwood whitish, otherwise yellowish brown; bark gray, coarsely checked, pale yellow except the surface, relatively thick; branches few and at the top, slender, horizontally spreading, green, sparingly rebranched, rigid. Leaves similarly disposed, opposite, scattering along the branches, chartaceous, only the very abrupt short but sharply acute tips recurved, broadly rounded and cordate at the base, curing greenish on both sides, in the fresh state a trifle paler green beneath, glabrous, entire, ovately oblong, 2 to 3 dm long, 10 to 13 cm wide toward the base; midrib raised beneath, plane above, smooth and yellowish green even in the dry state; lateral nerves of 12 pairs, divaricate, their tips ascendingly curved and faintly interarching, cross bars and reticulations obscure; petiole thick, glabrous, about 5 mm long, grooved on the upper side, curing reddish brown or black at the base; interaxillary stipule rim-like, short, rigid, glabrous. Inflorescence terminal, subpendant, rigid, in the bud state reddish brown, 5 to 8 cm long, strict, spicate; rachis thick, terete, gradually tapering to the distal end, glabrous, brown when dry, flowers rather densely clustered all around the rachis and subtended by bracteoles; pedicels 5 mm long, relatively very thick, also terete, glabrous, slightly enlarged toward the distal end, toward the base occasionally provided with minute bracts; bud calyx cup shaped, imbricate, 6 mm across, one half as high; sepals glabrous, 5, truncate at the base, broadly rounded at the apex, convex on the dorsal side, the middle basal portion quite thick and rigid, much thinner along the entire or minutely ciliate margins, nearly equal in size, 4.5 mm across, usually wider than long; corolla bud cylindrically elliptic, 1 to 1.5 cm long, 6 mm thick, broadly rounded at the apex, united except at the unequally 5-segmented apex, rigidly coriaceous, also glabrous on the exterior, valvate except the slightly imbricate distal ends; stamens 5, included; filaments inserted upon the basal portion of the corolla and falling with it, glabrous, 3 mm long, flattened toward the base, pointed toward the apex; anther oblong, 5 mm long, 1 mm wide, deeply bilobed at the basifixed base, obtusely rounded at the apex, laterally dehiscent, strongly grooved along the median lines; pistil 1 cm long, likewise glabrous, the ovary portion bottle shaped and terminated by a 2.5 mm long neck bearing an enlarged disk-like stigma.

Type specimen number 13169, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, May, 1911.

Collected in rich soil of dense forests at 750 feet altitude and along the trail to Napsan.

Allied to but not *Fagraea racemosa Jack*.

Fagraea epiphytica Elm. n. sp.

Large and coarse shrub, always epiphytic upon big trees; stems few, ascending or horizontal, 8 to 15 cm thick, 3 to 7 m long, terete, sparingly branched from below the middle; wood dingy white, finely concentric, moderately hard, the sapwood slightly bitter, odorless; branchlets long, curved or drooping, the leaf bearing tips ascending and 2.5 cm thick, doubly ridged between the opposite leaves which are from 2 cm to 8 cm apart. Blades descending, thickly coriaceous, paler green beneath, greatly varying in size, the larger ones 6 dm long and correspondingly wide, the average ones nearly 4 dm long by 1.5 dm wide above the middle, obovately oblong, narrowly cuneate at the base, apex rounded or occasionally obtusely so, entire, glabrous, edges coarsely rugose, curing unequally brown on its 2 sides; true petiole averaging 3 cm long, glabrous, very thick and gradually extending into the blade or the decurrent blade extending down along its sides, at the end thickened or expanded into the rugosely lobed thick plate which is of a darker green color; midrib very stout and prominent beneath, less prominent on the upper surface of the blade; lateral nerves 8 to 11 pairs, divaricate, gracefully curved and gradually disappearing toward the distal ends, the apical and basal ones short and inconspicuous, cross bars and reticulations obsolete. Flowers sweetly odorous, from 1 to 3 in the leaf axils or in the axils of their scars; pedicel 3 to 5 cm long, glabrous, usually curved, 1 cm thick at least, with a pair of bracts above the middle, gradually thickened and extending into the calyx portion toward the apex; bracts almost 2 cm long, 1 cm wide across the base, thick, glabrous, subacute at the apex, middle basal region very thick, margins much thinner; full grown calyx 5 cm long, the basal 1 cm united and turbinate, 5-lobed, 2 cm wide across the concrete top;

lobes ascending, imbricate, ultimately spreading in a twisting and curved manner, elliptic, very rigid, 4 cm long and averaging 3 cm wide, obtusely rounded, persistent in fruit; corolla 1.5 dm long, tubular toward the base, very leathery, funnel shaped toward the 5-lobed throat, entirely glabrous, 1.5 cm thick at the base, 4 to 6 cm across the throat of the corolla, rather early falling and becoming detached at the base through decay; lobes strongly imbricate in the bud state, 4 cm long by 3 cm wide, broadly elliptic, more or less spreading after anthesis, margins wavy and the outer overlapping portion usually recurved; stamens 5; filaments 5 to 7 cm long, inserted at the middle of the corolla or a trifle below it, strongly curved, glabrous, thickened toward the base and grooved along the ventral side, fleshy; anther oblong, 1 cm wide, 2 cm long, the back flat and excavated below the middle, dorsifixed, apex rounded, base lobed, face of cells fluted prior to opening; style also glabrous and fleshy, at least as long as the corolla, slenderer toward the spirally twisting apical portion. Fruits glaucous green, set into a 6 mm wide calyx cup, ovoidly fusiform, 13 cm long by 8 cm thick below the middle, terminated by a very strong 2 cm long mucronate point.

Type specimen number 13850, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September, 1912.

Upon the larger limbs of lofty forest trees and was only observed along the steep southern slope of Cawilanan peak at 4500 feet altitude where it was quite common. A very coarse plant for an epiphyte. The Manobo vernacular name is "Tumacos."

Flowers more tubularly elongated than in *Fagraea auriculata Jack* and petiole plates instead of being auricular are rugosely lobed.

Fagraea jackii Elm. n. sp.

Suberect tree or large shrub; stem 2.5 dm thick, 7 m high, terete, crooked, branched from below the middle; wood soft, sappy white, very bitter, quite tough, odorless; bark nearly 2.5 cm thick, conspicuously roughened on the dark gray or brown surfaces by the numerous elongated excrescences running longitudinally, otherwise yellowish; branchlets numerous, spreading and with suberect tips, curved or crooked, glabrous, with a shinning yollowish brown back, angular in the dry state. Leaves opposite, mostly horizontal, nearly flat, rigidly recurved, acuminate at the apex, obtuse or cuneate toward the base, lighter green beneath, glabrous, curing dull brown on both sides, very unequal in size, elongated, varying from 6 cm to 2.5 dm long by 3 to 8 cm wide across the middle or widest portion, edges entire but conspicuously rugulose or wavy; petiole 1.5 to 4 cm long, somewhat flattened and decurrent toward the lamina end, at the base provided with an interaxillary plate less than 1 cm wide and about one half as high, all glabrous, leaving large scars after falling; midrib stout and ridged beneath, plane or slightly raised on the upper side; the lateral nerves about 15 pairs more or less, strict, subdivaricate, scarcely evident. Flowers erect, terminal, 1 to 3-clustered, generally subtended by a small pair of leaves; pedicels 1 to 2 cm long, subterete, 7.5 mm wide, likewise glabrous; calyx green, at the base subtended by a pair of 1.5 cm long oblong bracts, angular, 3 cm long, erect or ultimately spreading, united at the base, the edges tightly imbricate; segments 5, oblong, rounded or obtusely rounded at the apex, the margins and apical portion much thinner, the dorsal median portion strongly bulged or ridged and on the hollow inner side filled with latex, surface smooth especially on the lighter green or brown fresh or dry states, persistent; corolla bud greenish, solidly imbricated, glutinous toward the base; corolla 15 to 18 cm long, tubular, yellowish, fleshy, glabrous, the basal 3 cm much constricted, the middle tubular portion 1.5 cm thick though gradually widened toward the lobed portion which is 5 to 8 cm long and 1 dm wide across the spreading tip; lobes 5, white, strongly imbricate, obovately elongated, 1 cm wide at the base and at least 2.5 cm wide toward the top, broadly rounded at the apex and usually notched or 2 to 3-irregularly toothed; stamens creamy white, inserted at about the middle of the corolla tube, not exceeding the lobes; filaments 4 to 6 cm longer, compressed, glabrous, pointed at their ends; anthers 1 cm long at least, 5 mm wide, versatile, flattened, oblong, grooved along the ventral side; style terete, greenish, fleshy, likewise glabrous, thickened toward the enlarged capitate dark green stigma, 10 to 13 cm long.

Type specimen number 13234, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, May, 1911.

In wet stony soil of wooded banks along the Iwahig river at about 750 feet above the sea level.

Not *Fagraea nonok Elm.* which is in fruit only. Leaves more elongated, not acuminate and with our calyx segments nearly twice as long. It is also quite different from the Javan specimens named *Fagraea auriculata Jack.* Dedicated to *William Jack* who besides his missionary work did considerable work in botany of the Malaya region.

Geniostoma laxa Elm. n. sp.

Lax shrub; stems 1 dm thick or smaller, 5 m high, branched from near the base; main branches suberect, numerously and laxly rebranched, the ultimate ones very slender, usually curved and with suberect tips; wood soft, dull sappy white, odorless, with a faint sweet taste; bark smooth, gray and brown mixed, light gray on the twigs, glabrous on the green young tips. Leaves thinly coriaceous, similarly green on both sides in the fresh state, curing nearly equally black on the sides, opposite, evenly scattered along the upper side, folded upon the same side, the slenderly acute or subcaudate apex recurved and subfalcate, entire, broadly cuneate or obtusely rounded at the base, elliptically elongated, the average of the larger lamina 9 cm long by one third as wide across the middle, occasionally much smaller especially at the top and broadly lanceolate, horizontally spreading; midrib narrowly caniculate on the upper surface, pronounced beneath, glabrous and black when dry; lateral nerves 4 to 5 pairs, relatively faint but equally seen from both sides when dry at least, ascendingly curved from the midrib, tips obscurely united, cross bars and reticulations obsolete; petiole 5 to 8 mm long, glabrate and black when old and dry, caniculate along the upper side. Inflorescence in small clusters but occasionally solitary, without odor; pedicel 5 mm long, usually provided at the base by a pair of short acutely pointed bracts or with a single bract toward the base, puberulent or glabrate, dark green, at the base subtended by short thick and usually acutely pointed bracts; calyx broadly cupular, 3.5 mm across, glabrate when old or puberulent, shallowly rugose around the outside, only one half as high, tapering at the base into the pedicel, the basal one half united, thick and leathery; the 5 apical teeth acute and erect, parallel veined, margins thinner and finely ciliate; the basal one third of the corolla united, nearly glabrous, 3 mm long; segments elliptically oblong, with 3 parallel veins, imbricate, the free margins very minutely ciliate, the rounded or subtruncate tips inflexed in the bud state, the free portion alternating with the calyx segments and in anthesis recurved between them, falling as a whole, villous about the inner side of the throat; stamens 5, alternating with the corolla segments and inserted upon their sinuses, subsessile, erect, introrse; anther 1.25 mm long, less than 1 mm wide toward the base, apex abruptly rounded and appearing with a subhyaline point, auriculately lobulate at the base, flattened, nearly hairless on the back, quite ciliate otherwise especially along the edges, ovately elongated; filaments adnate clear to the base of the corolla: ovary circular and much compressed, 1.25 mm across, the upper or free portion strigose; style 0.5 mm long, glabrate; stigma globose, a trifle less in diameter than the ovary, appearing puberulent.

Type specimen number 12280, *A. D. E. Elmer*, Magallanes (Mt. Giting-giting), Island of Sibuyan, April, 1910.

Gathered in moist gravelly soil along the wooded Patoo river banks at 1000 feet altitude.

Most similar to *Geniostoma cumingianum Benth.* founded upon *Cuming's* number 864. Leaves similar, flowers dissimilar.

Geniostoma mindanaense Elm. n. sp.

Shrubby and suberect; stem 5 cm thick, 3 to 4 m high, subterete, branched from below the middle; wood very soft, greenish white, quite odorless and tasteless; bark smooth, greenish brown, grass green except the epidermis; branches laxly rebranched, the green and glabrous young tips compressed, slender and descending or drooping. Leaves membranous, similarly disposed, flat, much lighter green beneath, when dry unequally greenish on its 2 sides, entire, apex gradually acuminate, base obtuse and occasionally inequilateral, the smallest ones broadly lanceolate, the others elongated and 15 cm long by one third as wide across the middle or below it, opposite and well scattered, the lower and terminal ones usually smaller than the middle pairs; petiole 5 mm long, green and glabrate, caniculate on the upper side; midrib dull green and rather prominent beneath, narrowly grooved above; lateral pairs 4 to 6 pairs, comparatively faint, much ascending and curved, reticulations minute and obscure; stipule in the early state pointed, when old truncately rounded, broad and interaxillary, 3 mm long, persistent, glabrous, thickly coriaceous. Flowers not observed. Fruits very dark green, in small lateral clusters, obovoidly globose, 8 mm across when fresh, glabrous, black or nearly so when dry; pedicels 3 to 5 mm long, recurved, subtended by bract vestiges; calyx persistent, pale green, glabrate and only finely ciliate along the 5 segments; seeds numerous, pitted, irregular, 1 mm across, imbedded in a juicy pulp.

Type specimen number 13812, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September, 1912.

Collected in wet ground among bowlders along the shaded Dalahion creek at 3000 feet altitude or just above its falls. "Sanguadan" in Manobo.

Possibly it is a *Rubiaceae*.

MAGNOLIACEAE

Kadsura apoensis Elm. n. sp.

Climbing about large tree trunks and reaching the main limbs; stem 3.5 cm thick, terete, divaricately branched toward the top; wood porous, flexible, reddish, odorless and tasteless; bark comparatively thick, coarsely checked longitudinally, reddish beneath the epidermis; branchlets smooth, somewhat drooping and recurved, yellowish brown on the twigs, greenish, forming tangled masses. Leaves alternatingly scattered along the branchlets, glabrous, descending, thickly coriaceous, dull and deep green on the shallowly conduplicate upper side, much lighter green beneath, the short obtuse or acute apex recurved, base broadly rounded, margins entire, in the dry state involute or slightly rolled upon the lower side, ovate or ovately oblong, drying equally brown on both sides, diverse in size, the normal blades 18 cm long and one half as wide below the middle; midrib bold beneath, furrowed on the upper side; the lateral nerves about 5 pairs, much ascending, coarsely forked toward their ends, reticulations very coarse and obscure; petiole glabrous, very thick and fleshy, 3 cm long, broadly expanded and slightly grooved above. Flowers odorless, 1 to 3-clustered from the leaf axils or from the axils of fallen leaves, upon terete 1.5 cm long bracteate pedicels; perianth segments greenish on the outer exposed sides, otherwise bright apple red, all ascending and imbricate, about 15 more or less, smooth and glabrous, erect and closely encircling the sexual organs, the middle one the largest, nearly 3 cm long and one half as wide, broadly oblong, the outer basal ones much shorter and relatively broader, the inner ones very thick, narrower and a trifle shorter than the largest bracts, all more or less united toward the base; the pistillate one soon turning reddish, upon a stout 5 mm thick stalk, 1.25 cm long, nearly 1 cm thick at the base; ovaries numerously imbricated, glabrous, oblong with truncate ends, angularly compressed, 2.5 mm long, 1.25 mm thick or wide, nearly black in the dry state; stigma brown pubescent, attached subterminally or sublaterally, obscurely compressed, 1 to 1.5 mm long, curved. Fruits apparently young, ovoidly globose, 5 cm across, hard, green except the inner side of the carpels which is deep red.

Type specimen number 11718, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, September, 1909.

Discovered this magnificent species in a very humid densely forested depression along the Mainit creek toward the Sibulan river at 4000 feet altitude. The Bagobos call it "Lomabog."

Apparently not *Kadsura scandens Blm.* nor the same as those collected by *Mrs. Clemens* in the lake Lanao region.

Kadsura sulphurea Elm. n. sp.

Scandent; old stem 5 cm thick, bendable, crooked, terete, numerously branched 5 m above the ground, forming densely interlaced masses; wood porous, reddish tinged, quite without odor and taste; bark relatively very thick, isabellinus except the sordid brown deeply checked epidermis; that portion on the branchlets smooth and brown, tough and inclined to twine, glabrous, turning reddish brown upon drying. Leaves alternate, widely scattering, the lower or older ones larger, thickly coriaceous, usually folded, glabrous, the acute to subacuminate apex recurved, entire margins subinvolute in the dry state at least, variable in size and shape, the upper or smaller ones 1 dm long by 4 cm wide, the larger ones twice as long and thrice as wide below the middle, the larger ones broadly rounded or even shallowly cordate at the base, broadly ovate to narrowly so or ovately elongated in the smaller blades, curing dull brown on both sides, paler green or subsulphureus pulverulent; midrib raised beneath, grooved above; lateral nerves 5 to 7 pairs, ascending and only a trifle curved, tips of the lower ones forked, those of the upper ones ascendingly curved and more or less disappearing, the basal 2 to 3 pairs arising from near the base in the larger lamina, cross bars faint, reticulations obsolete; petiole 1.5 to 3 cm long, glabrous, stout, dark green when fresh, dark brown when dry, widely canniculate along the upper side, ascendingly curved from the base. Flowers subpendant, solitary or in small clusters, upon short thick green and glabrous usually curved pedicels 1 to 2 cm in length, subtended toward the base by short and broad subpersistent bracts; sepals many, diverse in size, greenish, the outer ones very short and broad, the inner or longer ones nearly 1.5 cm long, ovate to ovately elliptic, imbricate, pulverulent on the exposed outer sides or smooth and glabrous; the inner ones gradually merging into the petals; petals about 8, glabrous, oblong, 1.75 to 1.25 cm long, 0.75 to 1 cm wide, thickened at the base, truncately rounded at the apex, ascending; male and female flowers forming an elongated cone 1.25 cm by 1 cm in dimensions; staminate flowers numerous, spirally arranged angularly compressed, the ventral side anther bearing, edges brown fringed or ciliated, 1 by 2 mm, sessile, apex obliquely truncate, the upper end usually tipped with a brown ciliately margined membrane; pistillate less numerous and only at the apical portion of the cone, very similar to the staminate flowers except the truncately rounded crustaceous stigma; ovules 2, smooth, lenticulate, encased in the basal portion of the pistil.

Type specimen number 13505, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, August, 1912.

Found among thickets and secondary woods along the fertile stream banks at about 250 feet above ocean level. "Canogon" in Manobo.

The specimens collected in the lake Lanao region by *Mrs. Clemens* have smaller leaves and flowers and no doubt are *Kadsura scandens Blm.* The field note of the Lanao specimens describes the flowers as red, ours are yellowish or exactly sulphureus.

MALPIGHIACEAE

Hiptage lawsonii Elm. n. sp.

Scandent shrub; stem crooked, terete, 2.5 cm thick, flexible, only few branched toward the top; wood soft, whitish, without odor or taste; bark grayish white, smooth, green beneath the epidermis; branches quite rigid, occasionally twining or twisting. Leaves chartaceous or rigidly coriaceous, descending, recurved, nearly flat, shining green above, much paler beneath, the entire margins subinvolute or merely recurved in the dry state, when dry brown beneath and ater above, glabrous, opposite, apex obtuse or subacute and recurved, obtuse toward the base though more or less decurrent at the base, subelliptic or oblongish, the larger blades 1 dm long and 4 cm wide at the middle or at its widest part, most of them however somewhat smaller, folded toward the apex and edges rugosely wavy; petiole glabrous, brownish black, stout, 1 cm long, flat on the upper side at the decurrent distal end, narrowly grooved toward the base; midrib prominent beneath and slightly raised along the upper side, curing darker brown; lateral nerves 5 to 7 on each side, ascending and curved, faint, their tips anastomosing, reticulations very numerous and quite evident from beneath. Flowers in small axillary groups, ascending, odorless; pedicel green, 6 mm long, terete, slightly thickened toward the distal end, subtended by a pair or whorl of short thick acutely pointed bracts, glabrate; bud subglobose, 3 mm in diameter; calyx green, 5 mm across, also glabrate, its 5 short teeth rotately spreading, rigid; corolla yellowish, strongly imbricate, ultimately divaricately spreading, alternating with the calyx teeth and as many, the inner ones a trifle smaller, broadly elliptic or ovately elliptic, 4 mm long and nearly as broad, glabrous, minutely purple streaked in the middle coriaceous region and sprinkled along the marginal sides, entire, edges more or less wavy or recurved; ovary dark green, 3 mm across, 2 mm high, glabrous, dark reddish brown in the dry specimens, apex flattened, terminated by a short style which is surrounded by 3 short and inwardly curved stamens; filaments compressed especially toward the dilated base, 0.5 mm long; anther rotund, 0.5 to 0.75 mm long, basifixed, dehiscing longitudinally at the top, connective very dark brown and thick, cells light yellow.

Type specimen number 12551, *A. D. E. Elmer*, Magallanes (Mt. Giting-giting), Island of Sibuyan, May, 1910.

Climbing upon a small tree in sand gravelly ground along the wooded banks of the Pauala river at 750 feet altitude.

Named after *M. A. Lawson* an eminent English botanist.

MALVACEAE

Abelmoschos todayense Elm. n. sp.

Bi or perennials; stems few to several from the same root, green, only sparingly branched, 6 to 9 dm high, terete, epidermis becoming longitudinally checked, covered with long yellowish and hispid hairs; root hard and tuberous. Leaves alternate and far apart, limp, early wilting, somewhat paler green beneath, curing slightly unequally brown on the 2 sides, 5-digitate, yellowish hispid on both sides, 8 to 10 cm across the lobed portion; lobes unequal, the terminal one 2 to 3 times longer than the basal ones, the basal lateral pair shortest and those of the smaller blades more united with the middle lateral pair of segments, the longer lobes 5 to 8 cm long from the base of the blade, 1 to 1.5 cm wide, linear or sublanceolate, margins coarsely toothed, apical portion of the longer segments acuminate, that of the basal or short segments acute and roundly pointed, the basal pair usually with a large tooth or lobule along its lower side; midrib evident from both sides in all the segments, lateral nerves very obscure or obsolete; petiole 5 to 8 cm long, ciliate, likewise green but brown on the dry specimens, terete, strict, ascending; stipules deciduous, very linear, 1 cm long, only sparsely long hairy. Flowers solitary from the uppermost leaf axils, upon 2 to 3 cm long and erect short pubescent and long ciliate peduncles which are subtended by reduced leaves, odorless, noding; calyx segments many, varying from 1 to 2 cm long, linear, 1.5 mm wide, bowl shaped at the base and tips inwardly curved, densely provided with yellowish brown setose hairs or bristles, coriaceous; petals almost 5 cm long, light yellow except the dark purple base, 5, narrowed toward the base, obovate, broadly rounded at the apex; ovary conical and angular, hairy; styles 2 from the base, adnate except toward the stigmatic portion, mostly thin and hyaline, 6 cm long; stigmas 2, protruded above the stamineal tube, fleshy, flattened, expanded toward the truncate apex which is scurfy or ciliate, nearly 2 mm wide across the top; stamens enclosing the pistil except the stigma, 5 mm long; filaments dilated toward the base, usually 2-veined, separating toward the base into 5 portions, tubular above the middle and anther bearing; anthers promiscuously scattered, upon very short though slender stalks, dorsifixed, broadly elliptic, nearly 1 mm long, cells widely spreading and subpersistent. Capsule 2 cm long, 1.5 cm wide below the middle, ovoidly ellipsoid, obscurely 5-ridged; seeds numerous, compressed, ater in color, round or short stalked or flatly cordate at the base.

Type specimen number 11028, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, June, 1909.

Collected in the upper region of cogonals at about 1000 feet altitude and in compact soil. The Bagobos call it "Telingcaran."

Apparently distinct from *Abelmoschus haenkeanus Presl.* It was distributed under an unpublished name.

MELASTOMATACEAE

Dissochaeta furfurascens Elm. n. sp.

Scandent along the tree trunks and sprawling; stem terete, 2.5 cm thick, branched all along, flexible; bark yellowish brown, shredded, green and smooth on the branches; wood green, soft, odorless and without taste, with a large brown pith; twigs long or slender, the ends drooping, angular and umber scurfy along the sunken sides, brown when dry. Leaves opposite, scattered, mostly descending, subchartaceous, lucid and slightly darker green above, the upper ones much reduced, entire, apex abruptly or gradually short acute; base of the smaller ones obtusely rounded, the larger broadly rounded and occasionally slightly cordate, ovately elliptic, the average blades 1 dm long by 4 cm wide below the middle, curing dark green, the lower side covered with isabellinus stellate hairs or scales especially along the veins and cross bars, easily separating upon drying; midvein straight and most prominent, beneath isabellinus scurfy, narrowly caniculate and glabrous upon the upper side, with 2 lateral pairs, the basal pair less conspicuous and 1 to 2 mm below the edge though parallel with it; cross bars more evident from the lower usually scurfy side, nearly straight and transverse, reticulations very obscure; petiole at most 1 cm long, very densely brown scurfy or tomentose, compressed, widened toward the distal end, ascendingly curved at the base, usually with similarly covered interaxillary bracts or buds. Inflorescence spicately paniculate, 1.5 dm long more or less, one half as wide at the base; rachis straight, green, angular and fluted along its sides, also covered with a stellate tomentum which soon wears off; branches opposite, divaricate, the lower ones 3 cm long and subtended by foliaceous bracts, short rebranched from the middle, otherwise similar to the rachis; the ultimate branchlets 5 mm long, subtended by short caducous bracteoles or only with very densely hairy vestiges, leaving large scars upon falling, all the joints irregularly enlarged; pedicel 5 to 11 mm long, usually subtended by a small pair of puberulent caducous and minutely glandular bracts, subterete, striate, puberulent and glandular dotted, articulate at the base and early falling; calyx with a deep cavity, 1 cm long or less, 4 mm thick, shallowly constricted below the truncate apical rim, subterete, glabrous except toward the puberulent base; corolla bud slenderly tapering; petals 4, free, caducous, strongly imbricate, 1 cm long or less, oblong, base board and truncate, apex acute and occasionally notched on the broader inner side, submembranous, glabrous; stamens apparently 7, of 2 distinct series; filaments coriaceous, ribbon-like, all inserted upon the calyx throat 2 mm below the rim, glabrous, those of the 4 substerile anthers 3 mm long and with a double loop above the middle; anthers nearly 6 mm long, very linear and tapering toward the apex, the base expanded and obscurely toothed, at the point of attachment provided with a pair of lateral blunt points; filaments of the 3 larger or fertile anthers nearly twice as long and with only a single loop; anthers of these 7 mm long, slenderly tapering to the apical pore, at the base extended into a pair of 1.25 mm long membrane-like teeth, all anthers reversed in the bud state; style 10 to 12 mm long, terete, fleshy, glabrous, 1 mm thick, slightly constricted at the small pulverulent stigma. Fruits upon twice as long pedicels, ellipsoid, including the constricted calyx rim, glabrous, yellowish green and upon the exposed sides turning atro-violaceus with age.

Type specimen number 13352, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, July, 1912.

Gathered in jungled woods and associated among other climbing vines at about 2000 feet elevation of Giwantanan knoll. "Cawelan" in Manobo.

Apparently not *Dissochaeta celebica Blm.* nor *Creochiton rosea Merr.*

Medinilla antonii Elm. n. sp.

Scandent and epiphytic; stem loosely twining or looping up to 7 m above ground, crooked, subterete, flexible, 2.5 cm thick; the outer wood white, the inner one half reddish to brown, soft, entirely without odor or taste; bark very thick, latericius except the yellowish gray and quite smooth or coarsely excrescent surface; main branches few from the top only, 1.5 to 2.5 cm thick, crookedly rebranched, forming tangled masses; twigs ascendingly curved, terete, striate, even the young tips glabrous. Leaves numerous, verticellate, rather crowded towards the ends of the twigs, coriaceous, glabrous, much paler green beneath, apex strongly recurved, obtusely rounded or gradually tapering and terminated by a mucronate point, ascending, base obtuse or subpandurate, otherwise nearly flat, curing grayish green beneath and nearly black above, exceedingly variable in size, the larger lamina 12 cm long by 3.5 cm wide at the middle, linearly oblong, edges entire, the smaller ones only one half as long and one third as wide; midrib plane above, straight, prominent and dark brown when dry beneath; the lateral veins in most of the smaller blades of 1 pair only and arising subopposite from 5 to 15 mm above the base of the leaf, the few very large blades with a second pair of lateral veins arising at the base and running parallel with the margin, the main pair extending clear into the apex; petiole 1.5 cm long, similar in color when dry, subterete and grooved along the upper side. Inflorescence profuse, lateral and below the foliage; stalks 1 to 3 cm long, arranged in verticellate clusters, umbellately few branched from above the middle, glabrous, pale green but turning brown when dry; pedicels 4 to 7 mm long, very similar to the peduncle proper, usually articulate below the middle; buds succulent, white, rather pointed; flowers odorless, pure white, rotately spreading in anthesis, 5 to 6 cm across, soon falling; calyx broadly campanulate, glabrous, 1 cm long, 8 mm wide across the slightly oblique truncate rim, terete; petals deciduous, 5, subequal, obovate or obovately oblong, apex broadly rounded or slightly oblique, 3 cm long by one half as wide across the widest portion, with fine veins; stamens 10, inserted upon the ovary rim, spreading in anthesis, in 2 unequal series; filaments very linear, hyaline winged, glabrous, the shorter ones 1 cm long, the longer 1.5 cm long, curved or looped, shorter anthers nearly equalling their filaments, much curved at the thickest lower portion and slightly recurved at the apex, also much lighter in color, opening by a terminal pore, basifixed, with a 1 mm long recurved spur and a pair of 1.5 mm long lateral appendages; longer anthers as long as their filaments, much slenderer, curved, only with a minute spur and the cell appendages reduced to gland shaped bodies or excrescences, otherwise similar to the other anthers; style fleshy, almost 3 cm long, glabrous, terete, terminated by a minute stigma; ovary completely imbedded, each of the 5 cells with a wad of numerous ovules.

Type specimen numbers 13477 and 13633, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, August, 1912.

The first number above cited was collected in a forested humid depression on the southwest side of Duros peak at 3000 feet elevation and was called "Lagicau" by the Manobos. The other more luxuriant material is from the forested ridge between Duros and Cawilanan peaks at 3500 feet altitude and was named "Etag" by the same natives. This very distinct, large and pure white flowered *Medinilla* I name after our son, *Anton Dambor Elmer.*

Medinilla rotundifolia Elm. n. sp.

A tree trunk climber; stem bendable, 2.5 cm thick, up to 10 m high above ground, subterete, twistingly circling about its support, with long roots from the lower side next to its host and particularly from the joints, repeatedly branched toward the top; wood white on the outside, dark latericius in the center; bark relatively very thick, smoothish, dirty yellowish gray, latericius except the epidermis; branches divaricate, lax, horizontal or descending, rebranched, light gray and more or less lenticelled; twigs suberect, glabrous even the young tips. Leaves opposite, similarly spreading, leathery, glabrous, much paler or yellowish green beneath, rotund, exceedingly variable in size but not in shape, entire or obscurely subinvolute when dry, curing dark or dull brown especially beneath, broadly rounded at the base and at the apex but terminated by a sharp point 5 to 8 mm in length, the larger blades 13 cm across both ways, the smaller ones less than one third as large, the average about 8 cm; midvein prominent beneath, plane above, straight clear into the apical point, with 2 lateral pairs of veins; the upper of these pairs arising 3 to 5 mm from the base, gracefully curved and confluent with the midvein at the base of the apical point; the basal pair less prominent and extending 5 mm below the margins near to the apical portion; cross bars and reticulations obsolete; petioles subterete, 2.5 to nearly 4 cm long, blackish when dry, slightly grooved along the upper side, striate beneath at the top or distal end. Flowers not found. Fruits lateral, few clustered, with a broad truncate rim, considerably constricted below it, otherwise subglobose though frequently rugose or lumpy especially toward the rim, hard, glaucous green, 2 cm long in the fresh state, the base much constricted and short pedicel-like, apparently 6-celled; peduncles ranging from 3 to 7 cm in length, smooth and glabrous, subterete, bearing few fruits toward their ends, pale green; pedicels 1 cm long, divaricate.

Type specimen number 13738, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September, 1912.

Discovered on a lateral side of a densely forested depression along the main ridge connecting Duros with Cawilanan peaks at 3500 feet elevation. The Manobos call it "Bodung."

Distinct from *Medinilla duodecandra Merr.* or its nearest ally.

Melastoma setosum Elm. n. sp.

Spreading shrub; stem 8 cm thick, 5 m high or less, subterete, crooked, branched from below the middle; wood sappy white, soft, without taste or odor and with a large pith; surface of the bark smooth and grayish brown, castaneus otherwise; main branches ascending, freely rebranched toward their ends; twigs ascending, green, submurinus when dry, the ultimate ones angular and striate, oppositely branched, densely covered with red bristle-like hairs or scales which are more numerous at the joints. Leaves also opposite, the terminal or smaller ones ascending, the lower or larger ones descending, flat, submembranous, deep green above, much lighter beneath, curing unequally blackish brown, appressed hirtellous on the upper and loosely hispid on the lower surfaces, the larger lamina 18 cm long by one half as wide below the middle, the smallest ones bract-like, the average probably 14 cm long by 5 to 6 cm wide, ovately elongated or ovately oblong, seldom elliptic, occasionally slightly inequilateral and somewhat curved toward the gradually tapering acute to acuminate apex, base obtusely or broadly rounded and only seldom a trifle inequilateral, entire or hispidly roughened; midvein very narrowly caniculate along the upper side, conspicuous beneath and pulverulent besides the numerous setose brown scales, with 2 to 3 lateral pairs of veins; the basal lateral pair faint and running 1 to 3 mm below the leaf edge, all the lateral pairs arising from the base and gracefully curved and extending into the apex, cross bars numerous, parallel, more or less oblique and the longer ones obliquely curved, secondary ones also numerous but much less evident on the lower side; petiole 1 to 3 cm long, channeled along the upper side, murinus when dry, densely setose, usually with a brush of finer lighter colored erect hairs in their axils. Inflorescence erect, terminal, 3 to 4 cm long and as broad, subtended by leaves; peduncle angular, setose, solitary though more commonly in 3's, when more than 1 the middle one stouter and longer, the short opposite branchlets of the middle one subtended by foliaceous bracts; flowers showy, odorless, coming into anthesis one by one; pedicels subtended by caducous bracts, 1.75 cm long, rather thick and rigid, densely beset with scale-like bristles; scales 5 to 7 mm long, the basal expanded portion 1 mm wide, edges nearly smooth except toward the scabrid bases; calyx 1 cm deep, terete, nearly as wide across the truncate top which bears 4 detachable segments, broadly rounded at the base, campanulate, densely setose; calyx segments 1.5 cm long, expanded at the base, smooth on the inner side below the middle, coriaceous, slenderly tapering from the base to the apex, equal, 3 mm wide at the middle, the median portion toward the base thickened, ciliate hairy; setae on the concrete portion of the calyx finely scabrid along the edges, the brown surfaces smooth and shinning; petals 4, rose red or light pink, early falling, 3.75 cm long, 2.5 cm wide toward the broadly rounded or across the more or less irregularly lobed or obliquely cut apex, cuneate and thickened toward the base, broadly obovate in general outline, glabrous except the apical edges which are usually brown ciliate; stamens 10, in 2 distinct series of 5; filaments of the larger series 1.33 cm long, linear, glabrous, much flattened, those of the smaller ones 1 cm long only; anthers of the smaller stamens sessile, 1 cm long, linear, the acuminately pointed apex usually curved, the cell portion laterally lobed and rugose, at the base constricted into a pair of glands; anthers of the larger ones a trifle longer and with a conspicuously curved filamentous basal portion 1.25 cm in length, attached a trifle above the bilobed base; style terete, 2.5 mm long, glabrous, terminated by a minute stigma.

Type specimen number 14168, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, October, 1912.

Discovered in soggy alluvial soil among dense jungles of woods at the lower end of lake Danao at 5000 feet altitude. "Carayan" in Manobo.

Very closely related to *Melastoma penicillatum Naud.* and *Melastoma molle Wall.*

Memecylon agusanense Elm. n. sp.

A small and handsome tree; stem 1 to 1.5 dm thick, 5 to 8 m high, irregularly terete, branched from the middle or from below it; wood hard, heavy, sapwood relatively thin, central mass brownish, odorless and with a faint sweet taste; main branches widely spreading, crooked, ultimately numerously rebranched; bark thin, dirty or yellowish brown, smooth or minutely checked longitudinally; twigs lax, very slender, horizontally spreading or subpendant, terete, the young tips glabrous and turning light brown upon drying. Leaves similarly disposed, coriaceous, shallowly curved upon the upper side, yellowish pale green beneath, the young ones yellow but drying black, opposite, copious along all branchlets, glabrous, curing very unequally brown on the 2 sides, the entire margins coarsely wavy and curved upon the nether side at least in the dry state, apex usually abruptly caudate and strongly recurved, base acute to obtuse, yellow on the upper side of the distal end of the petiole, narrowly to broadly elliptic or frequently lanceolate, the larger blades 6 cm long and at least 2.5 cm wide across the middle or a trifle below it; petiole 5 to 7 mm long, flat and grooved along the upper side, glabrous, yellow when dry, arising from thickened nodes or joints; midrib conspicuous beneath, depressed on the upper side below the middle; lateral nerves 4 to 7, ascending, strict, only faintly visible from the upper side. Inflorescence axillary, the small clusters not exceeding 1 cm in length; stalk suberect, green, glabrous or in the early state pulverulent, subterete, very short branched from the middle, solitary or 2 to 3-clustered; branchlets umbellately few clustered, subtended by thick glabrous and acute bracts; flowers odorless, violaceus in color; pedicel 2 mm long, glabrous, terete, subtended by a subwhorl of smooth acuminately pointed bracts less than 1 mm in length; buds obovoidly globose; calyx broadly cup shaped at the truncate apex, turbinate at the base, 1.5 mm long, 2 mm wide across the top when in bloom, smooth, thickly coriaceous; petals 4, comparatively membranous, caducous, free, nearly alike, the hyaline margins slightly imbricate when in the bud state, 2 mm long, 1.5 mm wide, broadly rounded at the apex, base truncately constricted, triangularly ovate, glabrous; stamens 8, inserted about the ovary, suberect; filaments subequal, 2 mm long, glabrous, subterete, tapering toward the distal end; anthers 1.25 mm long, attached to the under middle portion, 0.75 mm thick across the rounded apex; cells introrse and occupying the upper one half only, the basal one half extended into a recurved ventrally lobed acute spur; ovary imbedded, flat at the top; style terete, glabrous, 2 mm long, terminated by a minute stigma. Fruiting pedicels 1 mm thick, twice as long, terete, glabrous, subtended by a series of unequal rather sharply pointed subpersistent and glabrous bracts; fruit 4 mm long including the broad somewhat constricted calyx portion, 3 mm thick below the middle or widest portion, smooth, glabrous, hard, apparently with a single large seed.

Type specimen numbers 13562 in flower and 14181 in fruit, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, August and October respectively,

Both of these numbers were collected on steep densely forested inclines or sides of ravines at approximately 3500 feet altitude and in the general region between Duros and Cawilanan peaks. The first number cited was named "Siganog" by the Manobos who also named the other number "Lantoganon." They represent exactly the same species. The wood in the twigs of the flowering specimens had a slight odor of winter green or sweet chewing gum. I have on several occasions noticed this odorous character and recorded it so for *Memecylon odoratum Elm.* of Palawan.

Sufficiently distinct from *Memecylon densiflorum Merr.*, *Memecylon gitingense Elm.* and *Memecylon palawanense Elm.*

Memecylon gigantifolium Elm. n. sp.

A very slender tree; stem 1 dm thick, terete, crooked, 8 m high, branched at the top; wood hard and heavy, the thin outer portion whitish, latericius toward the center, without odor or taste; bark very thin, yellowish, smooth or flaking in thin plates, more or less finely checked on the branches; twigs terete, the young portion glabrous and reddish brown after being dried, quite rigid, horizontal or the longer ones somewhat drooping, only sparingly rebranched. Leaves opposite, well scattering along the branchlets, descending, rather heavy and chartaceous, the terminal ones smaller and frequently very unequal in size, duller green on the upper nearly flat side, the young ones light green, curing very unequally brown on the 2 sides, subsessile, the smaller ones rotund to ovate, the larger ones ovately oblong, 2.5 dm long by at least 12 cm wide below the middle; glabrous, apex gradually acute or occasionally rounded, the entire margins subinvolute, base broadly rounded and narrowly cordate; midrib exceedingly prominent beneath and reddish brown, deeply grooved along the upper surface of the leaf; lateral nerves of the average leaves about 20 pairs, subdivaricate, strict, similar in color and prominence beneath, impressed upon the upper side, the basal pair running 5 to 7 mm below the edge of the blade and strongly uniting with the tips of all the lateral nerves, few secondary ones intervening toward the base of the leaf, regular ones frequently branched, cross bars and the few coarse reticulations quite evident from beneath only. Inflorescence lateral, suberect, 3 to 5 cm long, paniculately branched from below the middle; stalks solitary or few clustered, subangular, dark brown when dry, puberulent; branches opposite or in subwhorls, subtended by rigid acutely pointed glabrous and persistent bracts which in the old state become reflexed, the lower or longer branches short umbellately rebranched, scurfy brown on the angular sides; flowers crowded from the ultimate thick branches, all stalks green when fresh; pedicels 2 cm long, terete, glabrous, subtended by a series of subpersistent glabrous and acuminately pointed 0.5 to 1 mm long bracts; calyx campanulate, coriaceous, also glabrous, 1.5 mm high, 0.5 mm wider across the truncate apex; corolla forming a cone 2 mm high and 2 mm wide across the truncate base, finally separating into about 4 segments, glabrous, submembranous; stamens 8 or twice as many as petals, included in the early state; filament smooth, less than 1 mm long, terete, fleshy, the inwardly curved apex pointed, otherwise relatively thick; anthers introrse in the bud state, 1.5 mm long at most, thickest across the rounded apex, base acutely pointed and recurved, inserted a trifle below the middle, the back side with a conspicuous gland located in the curve of the anther; ovary imbedded, its apical portion radially marked; style terete, glabrous, 2 mm long, pointed at the apex; stigma very minute. Fruits smooth and glabrous, 4 to 5 mm in diameter, bearing the calyx rim, compressed, globose, green, ater when dry.

Type specimen number 13548, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, August, 1912.

This slender tree-like undershrub was found in a wet and dense *Dipterocarpaceae* forested flat at 750 feet above sea and near a wild hog wallowing place. The Manobos call it "Magbabajag."

Memecylon urdanetense Elm. n. sp.

Only a small sized tree; stem 2.5 dm thick, 12 m high, branched from below the middle, subterete, nearly straight; wood odorless and without taste, hard, heavy, tough, brownish; bark thin and very dark brown, scaling in thin plates; branches slender, divaricate, freely rebranched; twigs glabrous, terete, dull reddish brown in the dry state. Leaves horizontal or descending, flat, the acute to subacuminate tips recurved, broadly obtuse at the base, elliptic, entire, curing yellowish or greenish brown especially upon the nether side, opposite, well scattered, rigidly coriaceous, much deeper green beneath, glabrous, the average blades 12 cm long by one half as wide across the middle; midrib minutely grooved above, prominent beneath and stramineus when dry; lateral nerves obscure, the basal pair running 5 mm from the edge of the leaf and connecting with the tips of the other lateral nerves, the balance of 10 to 14 pairs divaricate and straight, cross bars or reticulations none; petiole 7 to 12 mm long, glabrous, stout, hollowed along the upper side. Inflorescence lateral or from the leaf axils, ascending, 3 to 5 cm long, subumbellately branched from the middle; peduncle when young dark brown furfuraceous, ultimately smooth and yellowish green, solitary or 2 to 3-clustered, branches angular, similarly rebranched, spreading, grooved and scurfy brown along its sides, subtended by bract vestiges, relatively short; ultimate branchlets crowded, very short and very thick, brown scurfy, subtended by short and acute bracts; pedicels glabrous, crowded, 1.5 mm long, at the base surrounded by a series of short sharply pointed bracteoles; numerous flowers fragrant, umbellately congested; calyx 3 mm deep, 3 mm wide across the truncate apex, glabrate, cup shaped, upon a 2 to 3 mm long glabrate and terete pedicel; petals 4, triangularly ovate, straight across or truncate at the base, 2.5 mm long, rounded at the apex, 2.5 mm wide at the base, very early falling, glabrous, coriaceous though margins thinner, reflexed; stamens 8, inserted around the inner side of the calyx rim, becoming easily detached; filaments subterete, glabrous, 3 mm long; anther 2 mm long by 1 mm thick above the middle or its widest part, the basal one third devoid of pollen, backwardly curved, folded and acute, attached on the ventral side below the middle, apex broadly rounded; anther cells opening along the ventral side; ovary inferior, its sunken top radially marked; style subpersistent, 4 mm long, terete or nearly so; stigma minute. Fruits globose, 1 cm in diameter, hard and pale green, the calyx rim persistent.

Type specimen number 14113, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, October, 1912.

Gathered in dense woods upon a steep fertile and well drained incline at 3500 feet altitude situated between the peaks of Duros and Cawilanan. In the Manobo dialect it is called "Balitioan."

Its relation is very close to *Memecylon apoense Elm.* though primarily differing in its narrower leaves, more numerous and congested flowers, shorter inflorescent branches and with the submarginal vein twice as far from the edge of the leaf.

Sonerila lilacina Elm. n. sp.

Solitary herbs; stem reclining at the base and taking root along its lower side, terete, reddish brown, ultimately erect, 3 mm thick, varying from 1 to 3 dm high, occasionally few branched, dark brown puberulent to pubescent, usually curved. Leaves opposite, mostly toward the top, very membranous, horizontally spreading or descending, ovate to ovately lanceolate, often the opposite pairs quite unequal in size, the nether side grayish green when dry and minutely puncticulate, the upper surface sparsely covered with white ciliate hairs, margins entire about the broadly rounded and occasionally oblique and somewhat inequilateral base, otherwise very finely serrate, the serratures usually ciliate pointed, gradually tapering to the acute to acuminate apex, curing greenish to brown on the upper side, diverse in size, blades 3 to 5 cm long by 1 to 2 cm wide below the middle, frequently much smaller and merely bract like; petioles very slender, from 1 to 3 cm long, stramineus when dry and with brown very short more or less glandular tipped hairs, striate along the upper side; midrib practically straight, more evident from beneath, with 2 to 3 lateral pairs of nerves arising from below the middle and much ascendingly curved, cross bars very minute under a lens, that portion or region along the veins green, otherwise lilacinus beneath and purplish tinged above. Inflorescence terminal, erect, a few cm long; fruiting peduncle 2 cm long, bearing few to several capsules toward the distal end, rather stout, angular, straw brown, shining and glabrous, solitary or 2 to 3-clustered, subtended at the base by a pair or more of leaves; odorless flowers divaricate, usually pointing down hill, coming into anthesis one by one and of short duration only; pedicel of the flower not exceeding 5 mm in length, twice as long in the fruit and somewhat thickened, glabrate, strict; calyx as long as the flowering pedicel, striate and somewhat 3-angular, 2.5 mm wide across the top or widest portion, 3-segmented, green, the midvein of each of the segmented portion rather prominent and becoming ridged when old; segments ascending, 1 mm wide at the base, 1 mm long, glabrous, green, membranous, triangular, terminated in the fruiting state; buds fusiform, slenderly pointed, the petals imbricate, widely spreading in anthesis, caducous, 7 mm long, one half as wide across the base, very thin and almost transparent, 3, ovate though slenderly tapering into an acuminate point, glabrous, pulverulent on the conspicuous midvein on the dorsal side, otherwise glabrous, with quite evident lateral nerves, alternating with the calyx segments; stamens alternating with the petals and as many; filaments compressed, 5 mm long, glabrous, erect; anthers inverted in the bud state, erect in anthesis, 5 mm long, 1.75 mm wide across the auriculately lobed base, basifixed, slenderly pointed from the base to the apical pores; style glabrate, 1 cm long, strict though oblique, terminated by a smaller capitate stigma. Capsule triangular, truncately obovate, 5 mm long, as wide across the top, brown and chartaceous, persistent upon the pedicels, erect, the 3 cells dehiscing from the apex; placenta central, 3-winged especially toward the top, darker than the cell walls; seeds very numerous, 0.75 mm long, light brown, obliquely truncate at both ends, angularly flattened, apparently winged on one side.

Type specimen number 14135, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, October, 1912.

Scattering in wet red earth covered with a good layer of humus on a steep and forested incline along the trail on the south side of Cawilanan peak at 4500 feet altitude or about 500 feet below the summit. In the Manobo dialect it is called "Tagcaro."

Sonerila woodii Merr. but leaves average smaller, more ciliate especially along the edges and with a shade of steel blue or lilac. Its flowers are lilac rather than pink but otherwise the same as *Merrill's* species.

MELIACEAE

Vavaea ardisioides Elm. n. sp.

Large tree; trunk 1 m thick, 20 m high, bole-like, slightly wadded toward the base, its main branches arising from the middle or above it; wood moderately hard, thin sappy portion dingy or yellowish white, the interior portion isabellinus brown, quite without odor or taste; bark 2.5 cm thick, very dark brown on the smoothish or thinly scaling surface, almost cremeus otherwise; main branches spreading, ultimately numerously and crookedly rebranched, the short twigs arising in subwhorls and ascendingly curved, only the young tips puberulent. Leaves crowded toward the ends, subcoriaceous, alternate, grabrous, curing equally brown on both sides, when fresh much lighter green beneath, ascending or horizontal, conduplicate, diverse in size, the average ones 1 dm long by 4 cm wide above the middle, obovate or obovately elongated, bluntly rounded and shallowly emarginate at the apex, base cuneate, the smallest leaves scarcely one third as large; midrib stout and glabrous beneath, olivaceus puberulent along the sunken upper side; lateral nerves of 6 to 8 alternating pairs, ascending and only a trifle curved, tips much curved and anastomosing, reticulations quite numerous and more prominent on the under than on the upper side; petiole 1.25 cm long, puberulent especially upon the flattened upper side, thickened toward the base, finally glabrous. Inflorescence not observed. Infrutescence erect or nearly so, solitary in the leaf axils, about equalling the foliage; peduncle 4 to 7 cm long, glabrous, pale green and smooth, compressed, short branched toward the distal end, branchlets ascending, 1 cm long, also glabrous and compressed, subtended by short and rigid bracts, bearing at the distal end 1 to 3 fruits; pedicels 5 mm long or less, stout, subtended by bract vestiges, subarticulate at the calyx end; calyx a trifle shorter though thicker especially toward its distal end which is provided with 3 or 4 sharply pointed persistent calyx segments, subterete; fruits ovoidly globose or somewhat compressed, pale green, lividus and ultimately shining black on the same infrutescence, erect, 6 to 9 mm in diameter, apparently 2-celled and 2-seeded, the exocarp rather thin.

Type specimen number 13974, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, October, 1912.

Discovered in the woods among many spiny climbers on the summit of Duros peak at 4000 feet altitude. The natives or Manobos call it "Bagodan."

Fruits and leaves have the aspects of certain species of *Ardisia.*

Vavaea surigaoense Elm. n. sp.

A nearly erect undershrub; stem 5 cm thick, 3 to 4 m high, rebranched from the middle or below it; wood moderately hard, dingy white, without odor or taste; bark brown, smooth, hypodermis green, otherwise whitish or yellowish; branches divaricate, crooked, relatively short and few rebranched, the apical portion dirty or yellowish brown short hairy; twigs rigid, ascendingly curved at the leaf bearing tips.

Leaves ascending or horizontal, rigid and chartaceous, pale green yet still paler beneath, nearly flat, the entire margins subinvolute when dry, greatly varying in size, curing brown and greenish beneath, obovate to obovately elongated, occasionally suboblong, the upper surface minutely roughened along the reticulations, on the nether side strigosely white hairy, narrowly and sharply cuneate at the base or broadly so and with rounded ends, apex rounded or short and bluntly acute, the average leaves 2 dm long by 8 cm wide above the middle; midrib very prominent beneath and cinereously pubescent, the sunken line on the upper surface filled with tawny hairs; lateral nerves 11 to 13 pairs, divaricate and nearly straight, tips strongly curved upwards and usually united, otherwise similar, the midrib cross bars and fine reticulations very evident especially so on the under side; petiole 1 cm long, flat above, dirty pubescent, stout, much thickened toward the base; bud bract densely hairy. Inflorescence erect, leaf opposed or axillary, usually subterminal; peduncle stout, 5 to 8 cm long, subterete, short yellowish pubescent, strict, the few and short branches thick, hirtellous, subtended by caducous bract vestiges, 1 cm long or more often less in length or the longer ones nearly twice as long and rebranched toward the ends, bearing 1 to 3 flowers or fruits; calyx almost 5 mm long, the basal 2 mm relatively thick and somewhat angled, densely pubescent, acute to acuminately 4-toothed, the median region of the segments obscurely keeled; corolla bud ovoidly oblong; petals 4, alternating with the calyx lobes, puberulent on the back and on the ventral side toward the distal end, oblong, 5 mm long, nearly 3 mm wide across the truncate base, obtuse at the apex; stamens about 12, unequal yet all fertile; filaments united into a 1.5 mm deep rim-like tube which is entirely glabrous on the outside and densely hairy on the inner basal region, averaging 1 mm long, the longer ones alternating with the shorter ones, much compressed, densely ciliate on the ventral side below the anther and along its back side; the anther broadly elliptic or ovately so, 1 mm long, introrse, truncately rounded at the base, connective terminated by a minute point; ovary densely ciliate pubescent, the relatively thick 2 mm long style less pubescent; stigma flattish globose, 0.75 mm across, obscurely rugose, glabrous. Fruits ultimately glabrous, pale green to shining bright red, 1 cm in diameter, globose; its persistent calyx constricted toward the articulate base, the 4 teeth radially spreading, the whole of the calyx olivaceus hairy; exocarp thin, 2-celled and 2-seeded.

Type specimen numbers 13636 and 13940, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, August and September respectively, 1912.

Collected both numbers in more or less compact red soil mixed with stones on the forested ridge between Duros and Cawilanan peaks at 3500 feet altitude. The former was called "Condeman" by the Manobo and the latter "Magotamoying" by the same native. One or two flowers were still found on the first number cited and whose leaves average larger than those of the other fruiting specimens. This same species has elsewhere been collected in the Surigao province and apparently it is common in the Surigao peninsula.

MORACEAE

Conocephalus piperi Elm. n. sp.

A sprawling and climbing shrub; stem 2.5 cm thick, subterete, bendable, mainly branched toward the top; wood soft, entirely odorless and tasteless, white and brownish tinged, with a large pure white pith; old bark fumosus and excrescent, latericius otherwise; branchlets slender, avellaneus and lenticelled, tips glabrous and ascendingly curved, dusky brown when dry. Leaves horizontal or descending, coriaceous, folded upon the upper darker green surface, the entire margins wavy, glabrous, alternate, mostly toward the ends of the twigs, exceedingly variable in size, base broadly or truncately rounded, apex of the smaller ones obtuse, subacute in the larger blades which measure at least 2 dm in length and one half as wide across the middle or below it, the smaller blades ovate or occasionally elliptic, the larger ones ovately elliptic or subelongated, curing bluish green beneath, dull brown on the upper surface and as usual in all *Conocephalus* with circular pale white blotches; midrib pronounced beneath and similarly green, plane along the upper side; lateral nerves 4 to 6 pairs, the basal pair arising from near the base, ascending, strict, their tips strongly curved upward and obscurely united, also prominent beneath and of the same color, cross bars faint; petiole ranging from 5 to 20 cm long or longer or shorter, deep brown, glabrous, subterete, smooth though more or less striate; bud or interaxillary bract about 2 cm long, also glabrous, rigid, green but the inwardly folded margins brown in the natural state, ascending, gradually tapering and curved about the twig, with a small opening at the apex and at the base in the ventral axils, always inhabited by small black ants. Inflorescence erect, axillary, fragrant, 3 to 4 cm long; stalk yellowish white for the upper one half, the peduncle or lower portion greenish, glabrous, 3 cm long, forked and with a persistent whorl of bracts at the middle, at the base provided by a series of easily falling 2 cm long elongated greenish bracts; each fork or pedicel proper bearing a 1.5 cm thick, conglomerate head of male flowers; bracts in pairs at the point of forking and at the articulated and enlarged middle portion of the pedicels, the lower pairs subpersistent, 1 cm long, broadly ovate, obtuse, glabrate, leathery, deeply spoon shaped, pale green; staminate flowers densely clustered in globose individual heads 5 mm in diameter; individual flowers normally with 3 stamens, occasionally with only 2; perianth 1.5 mm long, tapering from the base toward the subtruncate apex, at the base occasionally ciliate and provided with minute reddish glands, brown when dry, very membranous, glabrous, dividing from the apex toward the base into 3 obovately oblong segments whose apical portions is provided with few large punctate appearing glands; filament thickened at the apex or distal end, exceeding the perianth, flat, midrib brown and with hyaline sides, opposite each perianth segment; anther after anthesis extrorse 0.5 to 0.66 mm long, subdorsifixed, ovately elliptic or oval, broadly lobulate at the base, notched or emarginate at the apex, persistent and empty cells curvingly twisted, laterally dehiscent; pistil apparently present, sterile.

Type specimen number 13653, *A. D. E. Elmer*, Cabad-

baran (Mt. Urdaneta), Province of Agusan, Mindanao, August, 1912.

Gathered from the Catangan creek banks among jungles overlying large bowlders at nearly 500 feet altitude. Dedicated to *Mr. C. V. Piper* who in 1911 to 1912 spent several months in these islands investigating certain features of economic botany. The Manobos call it "Hanopol."

This is an exact match to *Piper's* number 450 collected at Mati, district of Davao, Mindanao. His and mine are the only specimens thus far collected and they can easily be recognized from the common *Conocephalus violascens* (*Blco.*) *Merr.*

MYRISTICACEAE

Gymnacranthera laxa Elm. n. sp.

Middle sized tree; bole 3 dm thick, branched above the middle, 12 m high; wood soft, whitish and streaked with red vessels, odorless and tasteless; bark yellowish gray mottled, smooth, deep latericius except the epidermis, with a molasses colored juice; main branches spreading, freely rebranched; twigs lax, terete, more or less lenticelled, only the young tips yellowish brown puberulent, ascendingly curved. Leaves descending, subcoriaceous, shallowly curved upon the upper very deep green and sublicid surface, drying brown, glaucous green beneath even in the dry state, the acute or the sharply pointed subacuminate point recurved, base obtuse or on the largest ones obtusely rounded, the entire margins well curved upon the under side when dry, numerous, glabrous, alternate, 15 cm long by 4 cm wide above the middle though frequently smaller, oblanceolately oblong; midrib reddish brown beneath when dry and ridged, when fresh yellowish green, shallowly grooved along the upper side; lateral nerves 9 to 11 pairs, much less conspicuous, ascending and curved especially toward their ends which are usually united 3 mm below the edge, cross bars obscure; petiole 1 cm long, curing blackish brown, glabrous, flattened and grooved. Inflorescence lateral and usually below the foliage, profuse, very lax and flexible, spreading all around, dull green in the bud state, varying from 3 to 10 cm long, occasionally solitary but usually few clustered, alternatingly branched from near the base; stalks appressed tawny puberulent or pubescent, blackish brown when dry, the ultimate portion appearing zigzag; flowers odorless, subpendant, citrinus, usually 3 to 5-clustered; the clusters well scattered, alternating and in the early state subtended by a small light brown pubescent bract; the 3 pedicels more or less united at the base and subtended by a short very thick pubescent and persistent bract, the united portion more or less expanded and irregular in shape; the pedicels puberulous, slender, 5 to 8 mm long, perceptibly thickened toward the distal end, characteristically curved, quite rigid, the terminal one usually a trifle longer; bud ellipsoid, 4 mm long, 2.5 mm thick, widest above the middle, pulverulent, obscurely 3-angular or sided especially toward the short obtuse apex; perianth segments 3, opening from the apex toward the base, the acute apical portion becoming recurved and somewhat pubescent on the upper side, otherwise puberulent, coriaceous; stamens united into an erect column, subsessile or upon a very short filamentous glabrous tube, 3.5 mm long, 1.5 mm thick, the anther cells at the apex free and only obscurely extended over the middle of the column. Fruit not found.

Type specimen number 13715, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September, 1912.

In the humid forested depression between Duros and Cawilanan peaks at 3500 feet above ocean. "Magandau" or pretty in the Manobo dialect.

Both the leaves and inflorescence sufficiently distinguish it from *Gymnacranthera paniculata (DC.) Warb.*

Gymnacranthera urdanetensis Elm. n. sp.

An upright small or middle sized tree; stem 2 to 3 dm thick, 9 to 12 m high, terete, nearly straight, chiefly branched toward the top; wood soft, whitish, streaked with blood vessels, light in specific gravity; bark thick, dark brown and scaling in plates, latericius except the epidermis, bleeding, freely rebranched, terete, even the young portion of the twigs glabrous. Leaves alternate, coriaceous, paler green beneath, curing deep brown on both sides, somewhat folded upon the upper deep green surface, apex short acute and recurved, glabrous, base obtusely rounded, oblong or the larger ones a trifle wider above the middle, the entire margins curved upon the under side, the larger blades 2 dm long by 7 cm wide across the widest portion; petiole very stout, 2 cm long, entirely glabrous, dark reddish brown in the dry state, the young ones pale green, fluted along the upper flattened surface; midrib yellowish green in the natural state, like the petiole when dry very pronounced beneath, appearing doubly grooved along the upper side; lateral nerves of 15 to 18 pinnate pairs, tips more strongly curved and very faintly united, otherwise rather conspicuous beneath, cross bars and reticulations obscure. Inflorescence mostly axillary, in umbellate clusters from short common stalks or tubercles, 1 to 2 cm across when in anthesis; pedicels spreading, 5 mm long, strict, stout, puberulent, at the base surrounded by a minute rim-like bract, at the distal end bearing a spoon shaped coriaceous dorsally puberulent ovate to elliptic and 3 mm long bract; bud ovoidly ellipsoid, 5 mm long, at least 3 mm thick, sessile, toward the apex more or less 3-sided, glabrate or puberulent; perianth segments 3, coriaceous, opening from the acute apex toward the united base; the apex of the stamens columnar, erect, 3 mm long, about 1 mm wide, the basal one third or filamentous portion glabrous; anther cells not quite extending to the obtusely rounded apex, varying in length, the walls light yellow and membranous. Fruits subglobose, 4.5 cm in diameter, apparently quite young, covered with a deep fulvus tomentum, upon 1 to 2 cm long ligneous stalks, the terminal or pedicel portion of which is much enlarge.

Type specimen numbers 13295 and 13294, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, July, 1912.

Both of these numbers were collected the same day in the same place along the wooded knoll of Giwantanan at 1750 feet altitude. The first number cited was called "Imos" by my

Manobo companion who as readily named the other specimens "Bantolinau." They represent the same species.

This is *Myristica cumingii Warb.* rather than *Myristica agusanensis Elm.* Chief differences from the former species are the larger fruit which is more nearly globose in shape and both kinds of flowers without the lengthened common stalk.

Myristica agusanensis Elm. n. sp.

Only an ordinary sized tree; trunk terete, at least 3 dm thick, 12 m high, wadded at the base, mainly branched toward the top; wood soft and light in weight, whitish but after being cut exuding a dark blood colored sap or juice, entirely without odor or taste; bark thick, dark reddish brown and with a similarly colored sap, epidermis scaling in small plates; branches laxly rebranced, heavy, the slender twigs green and somewhat drooping, terete, glabrous, dull reddish brown when dry. Leaves coriaceous, glabrous, alternate and quite numerous, folded along the upper lucid side, glaucous green beneath, curing unequally brown on its 2 sides, the acute to acuminate apex recurved, base obtusely rounded, entire margins more or less rugulose, oblong, the larger lamina 15 cm long by 4.5 cm wide at or a trifle below the middle; midrid ridged beneath and brown when dry, plane above except toward the base; lateral nerves 13 to 15 pinnate pairs, their tips disappearing, relatively faint, cross bars or reticulations none; petiole nearly 2 cm long, glabrous, dark brown, plane along the upper side, ascendingly curved, young or bud leaves light yellowish pubescent especially on the nether side. Flowers not observed. Fruits solitary or in pairs, mostly axillary, ellipsoid, 3.5 cm long one side, hanging, fulvus brown but not pubescent, smooth; exocarp thick, longitudinally separating; nut ellipsoid, covered and impressed with deep red cartilaginous strands from the base to the apex, shining; stalks 1 to 3 cm long, greenish in the fresh state, otherwise blackish brown, flexible when young, occasionally short branched.

Type specimen number 13284, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, July, 1912.

Collected this wild nutmeg tree in compact and well drained red soil along a ridge of dense woods of Giwantanan at 1250 feet altitude. The Manobos call it "Dugoan."

Related to *Myristica cumingii Warb.* and may more properly belong to the genus *Knema.*

MYRTACEAE

Eucalyptus binacag Elm. n. comb. *Eugenia binacag Elm.* Leaf. Philip. Bot. VII, 2351, 1914.

In my opinion there are more than one species of *Eucalyptus* on the island of Mindanao.

Eugenia abbreviata Elm. n. sp.

A small stocky tree; stem 2 dm thick, 7 m high, its main branches ascending and arising from above the middle; twigs numerous, erect, forming a rigid dense flattish crown, the green leaf bearing portion glabrous and subangular, the older twigs covered with a thin grayish epidermis and a cinnamon brown hypodermis. Leaves opposite, divaricate or descending, very strongly folded upon the upper deeper green and sublucid side, entire, much paler green beneath and minutely punctate, curing brown, ovate but gradually tapering to the much recurved sharply acuminate to caudate apex, base broadly obtuse, glabrous, rigidly chartaceous, margins callously edged and entire; midrib quite pronounced beneath, sunken along the upper leaf surface; lateral nerves 7 to 10 in each one half, divaricate, faint, a trifle more apparent beneath, nearly straight, their tips forming a united submarginal line, reticulations very obscure and obsolete from above; petiole 5 mm long, usually recurved, caniculate, glabrous, reddish brown or nearly black. Inflorescence usually exceeding the foliage, erect, terminal, also profuse, from 1 to 3 cm long, few and short branched at the base only, subtended by small leaves; peduncle and ascending branchlets glabrous, angular, relatively thick, the lateral articulated at the base and bearing toward the distal end a small cluster of flowers; flowers subtended by caducous bracts or bract vestiges; calyx cuneately pointed toward the subsessile base, 5 mm high, 3.5 mm wide across the rimlike apex, glabrous, turbinate, very obscurely 5-apiculate, greenish; petals creamy white, caducous, falling separately, 1.5 mm across, margins entire or irregularly cut, inserted upon the calyx rim; stamens numerous, inwardly curved especially in the bud state, corolla colored; filaments glabrous, 0.75 mm long, dark brown, gradually tapering from the base to the fine apex; anther basifixed, the 2 subglobose pale yellow sacs well separated; ovary apex flatly cone shaped, terminated by the pointed style which bears the minute stigma.

Type specimen number 14263, *A. D. E. Elmer*, Baguio (Mt. Santo Tomas), Province of Benguet, Luzon, March, 1913.

Found in the densely wooded summit region of mount Santo Tomas at 7000 feet altitude.

Very closely related to *Eugenia parva (Merr.) C. B. Rob.* and to *Eugenia perpallida Merr.* yet in my opinion it is specifically distinct.

MYRSINACEAE

Ardisia cuprea Elm. n. sp.

Small, not an upright tree; stem 1 dm thick, 5 m high, terete; wood moderately soft, odorless and tasteless, the outer one half white, the balance reddish, tinged with distinct radial lines; bark yellowish gray, smooth, otherwise brown; branches slender, crowded toward the top, divaricate, unbranched, terete, when dry nearly testaceus. Leaves alternatingly scattered, horizontal or descending, smooth, glabrous, lighter green beneath, coriaceous, elliptic, entire, apex short and abruptly acute, base obtusely rounded, curing brown above and characteristically cupreus beneath, greatly varying in size, the larger blades 2 dm long by 8 cm wide across the widest portion, the upper side obscurely punctate; midrib conspicuous beneath, grooved along the upper side especially toward the base; lateral nerves also conspicuous beneath, 11 to 17 pairs, subparallel, ascending, nearly straight, toward their tips much curved upward and gradually disappearing, reticulations numerous and quite evident from the upper side at least; petiole 1.5 to 2 cm long, very stout, somewhat thickened toward the ascendingly curved base, dark copper brown when dry, deeply channeled along the side, glabrous. Flowers not found. Young infrutescence mostly descending from the leaf axils; stalk 1 to 2 cm long, usually unbranched, the larger ones sometimes few and short branched, very thick especially toward the base, irregularly angular, at the base as well as the base of the branchlets subtended by thick transverse bract vestiges, dark brown when dry, sparsely pulverulent; pedicels few to severally clustered from the distal end, ascendingly curved, pulverulent, subterete, gradually thickened toward the distal end, at the base enlarged and leaving large scars after falling, 1 to 1.5 cm long, reddish in the natural state, similar dark brown when dry; fruits subtended by the distended 5 calyx segments, terminated by a very slender style, ovoidly globose, glabrous, 5 mm long, very dark or dull brown in the dry state.

Type specimen number 13287, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, July, 1912.

Collected in rich well drained and deeply humus covered ground near a forested ridge at 1500 feet above ocean level. The manobos call it "Sima-sima."

A critical segregate from *Ardisia disticha DC.*

Ardisia curtiflora Elm. n. sp.

Tree-like shrub; stem 1 dm thick, terete but crooked, 5 m high, bearing at the top a dense crown of branches; wood soft and pulpy, white, odorless and entirely tasteless, with fine radial lines; bark yellowish brown, smooth and with lighter brown excrescences, latericius otherwise; branches divaricate, flexible, the lower or longer ones drooping and occasionally branched, otherwise unbranched, numerous, obscurely angular, much shortened toward the top where they are rusty brown, the sides striately marked from leaf to leaf, the young apical tips fulvus pulverulent. Leaves heavy and coriaceous, in distichous rows, horizontal, the slender and gradually acuminate apex recurved, conduplicate, numerous, dull green except the base which is lighter colored, glabrous, curing brown on both sides, entire or the edges wrinkled, rounded at the base, broadly lanceolate to oblongish, the larger blades 13 cm long by 3 cm wide across the middle or its widest portion, frequently much smaller, obscurely punctate from both sides; midrib pronounced beneath, sunken along the upper side especially at the base and with the leaf sides curving over the caniculation, dark brown when dry; lateral nerves 7 to 9 pairs, ascendingly curved, rather fine, reticulations not evident. Inflorescence densely clustered in the lowermost leaf axils, pendant in the bud state, at most 1.5 cm long; stalks solitary and numerously branched from near the base or with a few stalks arising from the base and sparingly rebranched, all fulvus pubescent, thick, more or less angular, the branchlets subtended by bract vestiges; pedicels 3 mm in length, densely cinnamon brown puberulent, 0.75 mm thick, subtended at the base, the 5 segments ultimately spreading, triangularly oblong, 1.25 mm long, minutely puberulent on the bark especially toward the base, otherwise glabrous, dark reddish brown punctate, margins hyaline and provided with very minute cilia; petals 5, alternating with the calyx teeth, 2.5 mm long by 1.5 mm wide at the middle, elliptic, submembranous, glabrous, glandular, imbricate in the bud state; stamens as many, subsessile, nearly as long as the petals, obtuse at the apex, base auriculately lobed, basifixed, laterally dehiscent; connective darker brown and more or less glandular; style 2 mm long, strict, glandular and less in diameter at the apex, base conically expanded or ovary-like; stigma very small. Fruiting pedicels nearly twice as long, glabrate; fruit dark wine red when mature, flatly globose, shining, subtended by the 5 rather small brownish calyx segments, apex quite conspicuous, 8 mm in diameter or smaller.

Type specimen number 14169, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, October, 1912.

Discovered this rare and very distinct *Ardisia* in wet alluvial soil among dense jungled woods bordering the lower end of lake Danao at 5000 feet altitude. Its vernacular

Manobo name is "Candingon."

Discocalyx congestiflora Elm. n. sp.

Upright and shrubby; stem terete, 3.5 cm thick, 3 m high, more or less crooked and unbranched; wood soft, radially marked, only the thin sapwood white, otherwise reddish tinged, odorless and without taste, with a large pith; bark dull brown and smooth, isabellinus except the epidermis. Leaves alternatingly clustered toward the end of the thick stem or in subwhorls of seasonal growths, radially spreading, horizontal or descending, leathery, shining deep green on the upper side, paler green beneath, glabrous, curing grayish brown, elongated, the average lamina 4 dm long by 11 cm wide at the middle, entire toward the attenuate or slenderly cuneate base, otherwise minutely denticulate, apex gradually tapering to the acute and recurved point; midrib exceedingly strong and prominent beneath, curing similarly grayish, deeply grooved along the upper side; lateral nerves 13 to 17 pairs, with secondary intervening ones from the midrib to one half the distance to the margins, gradually curved upwards, their tips reticulately united, coarse reticulations quite evident from beneath, the finer reticulations more evident from the upper side; petiole 1 dm or less in length, 6 mm thick, subterete except the canal, thickened at the base and leaving large scars after falling, drying gray, also glabrous. Inflorescence usually between the whorls of the foliage, divaricate; peduncle varying from 7 to 17 cm long, stout, green, glabrous, grayish brown when dry, compressed, perceptibly thickened toward the distal end which is terminated by 1 or more of short and exceedingly thickened ligneous branches with transverse scars; bud inflorescence covered with caducous imbricated bracts; these bracts are membranous, blackish brown when dry, glabrous, whitish in the fresh state but early wilting, 1 to 1.5 cm long, oblong though gradually tapering from the base to the apex, deep purple streaked or spotted, leaving transverse scars after falling, those subtending the flower bearing stalks very similar and also caducous; panicles averaging 1 dm long, radially spreading, glabrous, purpureus as are also the odorless flowers, very flexible and soft in texture, alternatingly branched from the base; the lower or larger branches rebranched from the middle; pedicel 2 to 3 mm long, glabrous, more or less gland dotted, slightly thickened toward the distal end; calyx at least 1 mm long, broader than long, the 5 segments united at the base or below the middle; segments rotund, glabrous, margins subhyaline, dark reddish brown glandular; petals equal in number, becoming nearly free, thinner in texture, also glabrous and glandularly punctate, broadly elliptic, 2 mm long by 1.25 mm wide across the middle, alternating with the calyx teeth, easily detached; stamens 5, opposite the petals and inserted upon their inner bases, falling with them; filaments compressed, tapering from the base toward the apex, glabrous, 0.5 mm long; anthers introrse, as long as the filaments, whitish in the dry state, broader than long, truncate at both ends though the upper end a trifle wider, laterally dehiscent; connective black, exerted as a stigma-like projection; ovary imbedded in the concrete calyx base; style thick, 1 mm long, glabrous, brown, bearing a blackish slightly expanded stigma. Mature fruit globose, 5 to 7 mm in diameter, glabrous, when dry almost black and obscurely punctate.

Type specimen number 13724, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September, 1912.

Collected this undershrub in a very wet forested gully of rich soil at 3500 feet altitude and situated between Duros and Cawilanan peaks. "Cetaas" in Manobo.

Discocalyx longifolia Merr. but less glandular and our calyx and corolla are very unequal. The leaves are entirely too large to be classed with *Discocalyx montana Elm.*

Discocalyx macrocarpa Elm. n. sp.

Tree, with a 7 dm thick and 15 dm high stem; wood moderately soft, whitish, easily cutting and splitting, odorless and tasteless; bark thick, rather finely checked longitudinally, gray or brown on the branches; the numerous slender twigs green, heavy, usually descending, even the young portions glabrous. Leaves also descending, alternate, coriaceous, smooth and shining deep green on the upper strongly folded surface, the short acute to subacuminate point recurved, base broadly obtuse, margins entire although obscurely wavy and slightly involute in the dry state, oblongish, curing shining brown on the upper side and duller so beneath, the larger blades 15 cm long and 6 cm wide at the middle, occasionally longer and broader, frequently much smaller, glabrous; midrib prominent, flat on the upper leaf surface; lateral nerves yellowish green, 6 to 8 pairs, ascendingly curved especially toward their tips, the cross bars and fine reticulations obscure yet equally visible on both sides; petiole 1.5 cm long, glabrous, channeled along the upper side which at the base of the lamina is usually provided with a vestige of glands. Inflorescence profusely paniculate, terminal or from the leaf axils, all the stalks glabrous and green, 5 to 15 cm long, branched from below the middle; branches alternate. unbranched, when young only sparsely and minutely scurfy, subtended by blunt bracts; buds and flowers creamy yellow, alternatingly scattered, subtended by bracteoles, deciduous and sweetly fragrant; pedicels none or very short and thick, subtended by very sharply acuminate rigid bracts; calyx cup shaped, the basal one third thick and united, glabrous especially on the inner side, eglandular; segments 5, rotundly oblong, rounded at the apex, imbricate, the free portion 1.5 mm long by 1 mm wide, the entire margins quite thin, the middle portion thick; petals in the bud state ovoidly globose, imbricate, 3.5 mm long, below the middle united, glabrous and without glands; segments 5, yellow, elliptic, leathery, 2 mm long by 1.5 mm wide, rotately spreading in anthesis, concave upon the lower side, obtusely rounded at the apex; stamens 5, opposite the petals and inserted upon them a trifle below the middle, filaments very short and glabrous; anthers bright yellow, without glands, 1 mm long, somewhat flattened, ovate from the side view, basifixed, erect; pistils 2.5 mm long, greenish yellow, glabrous, the ellipsoid ovary gradually extending into the very short and thick style which bears the stigmatic portion across its truncate tip; fruit ovoidly ellipsoid, 2.5

cm long, shining, red and turning purple when fully ripe, with a large dull red seed.

Type specimen numbers 10553 and 10660 with flowers and 11867 with fruit, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, May for the flowering specimens and September for the fruiting number, 1909.

Rather common in ravines or upon ridges of secondary forests from 2500 to 3750 feet elevation. The vernacular Bagobo name for all numbers is "Pamaluyan."

Remarkable for its tree size and large fruits. Through an oversight it was omitted in my article on the mount Apo *Myrsinaceae*.

Embelia urdanetensis Elm. n. sp.

A small tree climber and sprawling over its top; stem very tough, 1.5 cm thick, densely lenticelled, terete; main branches long, flexible, rebranched, the free ends hanging; wood white, moderately soft, odorless and quite tasteless; bark brown, yellowish white lenticelled, the inner portion yellowish. Leaves glabrous, very copious, alternate, folded and strongly recurved toward the acute to obtuse apex, at the base varying from broadly cuneate to obtuse or even rounded in the largest blades, entire margins subinvolute in the dry state especially toward the base, obovately elliptic, 5 to 8 cm long without the petiole, 2 to 3 cm wide a trifle above the middle, curing gray especially upon the upper side, both sides under a lens appearing minutely black punctate; petiole 1 to 1.5 cm long, almost black when dry, stout, deeply caniculate along the upper side; midrib prominent beneath, deeply caniculate along the upper side; lateral nerves 10 to 15 pairs though with intervening secondary ones toward the midrib, oblique, tips ascendingly curved, quite evident especially from the upper side, reticulations numerous and also more evident from the upper surface. Flowers not seen. Infrutescent panicle terminal, erect, 1 to 2 dm long, relatively broad at the base; rachis stout, pale green, angular or angularly ridged, glabrous or the young tips light pulverulent; branches alternate, similar in color and shape, flexible, rebranched from near the base, yellowish pulverulent, the ultimate fruit bearing branchlets greatly varying in length, almost at right angle to its stem; fruits alternatingly scattered from below the middle, only seldom opposite, upon very short yet distinct pedicels, globose, 2 mm in diameter, mucronate at the apex, glabrous, reddish brown spotted, ultimately becoming dark purpureus, at the base subtended by the 4-toothed calyx; pedicel subtended by persistent bracts; these bracts are 1.5 mm long, elongated, sharply pointed, in the earlier state folded on the upper or ventral side, when old reflexed, glabrate and with a few large purple spots as is also the similarly spotted calyx.

Type specimen number 13745, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September, 1912.

Gathered from the summit woods of mount Urdaneta or Masay according to the Manobos at 6500 feet above sea level. The natives called it "Buluan."

H. N. Whitford's number 1308 from mount Mariveles is the type in flower for *Embelia whitfordii Merr.* Number 453 of *Dr. Whitford's* collection from the same mountain is in fruit. Our leaves are more distinctly nerved and upon drying turn grayish, not dark brown as the Mariveles material nor is our infrutescence pubescent.

Rapanea glandulosa Elm. n. sp.

An epiphytic shrub; stems few to several, 4 to 7 dm long, branched from below the middle, 3 to 5 cm thick at the base, terete; ultimate branchlets numerous, rigid, the apical portion glabrous and ridged. Leaves terminally crowded, alternate though attached on all sides of the twigs, numerous, obovately oblong, varying 4 to 7 cm long by 1.5 to 2.5 cm wide a trifle above the middle, the entire margins somewhat curved upon the much paler green nether side glabrous, rigidly coriaceous, shining and nearly flat on the upper surface which is covered with rather large punctate glands, the lower side obscurely punctate, apex obtusely rounded or broadly rounded and minutely emarginate, toward the base cuneate, at the base decurrent, curing unequally brown on both sides; midrib prominently ridged beneath, much less so above; lateral nerves 5 to 8 on each side, ascending, strongly curved toward their ends, very obscure though in the dry leaves more evident from the upper surface, reticulations obsolete; petiole 5 mm long, thick, dark or blackish brown when dry, flat along the upper side. Inflorescence not collected. Infrutescence copiously clustered along the branchlets below the leaves; tubercles or common stems 5 to 8 mm long, ascending, thick, terete, glabrous, covered with numerous imbricating scales transversely arranged, unbranched, alternatingly scattered; pedicels strict, 3 to 5 mm long, pale green, terete, also glabrous, severally and umbellately scattered from the distal ends of the tubercles, each subtended by a broad persistent bract; fruits globose or nearly so, 2.5 mm in diameter, glabrous, densely verrucose with reddish brown glands, terminated by the subpersistent slender style, at the base subtended by the 4 calyx teeth or segments.

Type specimen number 14148, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, October, 1912.

Inhabiting lofty trees on a windy north ridge at 4500 feet altitude of Cawilanan peak. "Nagas" in Manobo.

Leaves the size and shape of *Rapanea philippinensis DC.* but our fruits are densely glandular.

NEPENTHACEAE

Nepenthes surigaoensis Elm. n. sp.

A creeping and sprawling pitcher plant; stem trailing among jungles or subscandent along much slanting stems of trees up to 3 m high, seldom rebranched, 1.25 thick, the old or leafless portion brown and angular, the upper or leaf bearing portion green and also quadangular by the decurrent leaf bases, bendable, very strong and tough. Leaf bract 1 dm long, strongly imbricate and linear, tipped with an appendage; leaves alternatingly scattered, rather close toward the flower bearing top, the basal ones 7 to 14 cm apart, horizontally spreading, quite rigid and coriaceous, nearly flat but gradually recurved toward the acute to obtuse apex, much paler green beneath, those without pitchers bearing a wiry tendril once or twice curved at or near the apex, only the young tips of the dendrils fulvus pubescent; blades 2.5 to 4 dm long, 4 cm wide across the widest portion, curing unequally brown on the 2 sides, the marginal sides usually curing upon the ventral side, all strongly decurrent at the base, the uppermost leaves a trifle shorter and widest at the base, the lower or older leaves longer and gradually narrowed toward the base, beneath minutely dark brown spotted or punctate, much wrinkled on the upper surface when dry; pitcher bearing tendril 1 m long or shorter, hanging, quite rigid, terete, rather straight when supported, otherwise curving, green, glabrous, tinged with red, gradually thickened from the leaf tip toward the pitcher; midrib conspicuous beneath, plane above, with 4 fine parallel veins on each side, obscure cross bars more evident from the upper side and suboblique; pitcher inclining or when lying upon mossy surface almost horizontal, ellipsoid, 1.5 dm long or shorter, dull purple spotted all over the exterior except the atropurpureus blotches on the inside, orifice very oblique though in its natural state horizontal, the lid nearly erect, the outside numerously and conspicuously veined, cross bars less conspicuous, more or less covered with glistening brown hairs, gradually curving around the 1 dm thick middle and from base to apex, few ridged on the base toward the apex or at the base of the lid; wings along the ventral or upper side extending from the upper end of the throat to within 1.75 cm from the thickened and much curved apical end of the stalk, 1 cm wide, similar in color and hairyness, membranous, its reticulations forming 2 rather obscure longitudinal lines, slenderly and finely ciliate along the entire length of the outer edge; short ellipsoid orifice stoutly provided with a thickened much recurved margin which along its upper surface is provided with a numerous transversely ridged membrane; lid 8 cm long by 6.5 cm wide, perfectly elliptic, narrowly cordate at the base where it is provided with an erect 1 cm long reddish brown pubescent point; main nerves 2 from near the base, soon becoming forked and few to several veined in each one half, the forked basal vein very prominent on the upper side and similarly pubescent, conduplicate, shining and glabrous on the outer or lower sides, strigose on the upper side. Flowering spike terminal, 4 dm long, erect yet usually curved, flower bearing from below the middle, green stalks turning dull brown upon drying, fulvus tomentose toward the young or bud bearing tips, ultimately glabrate, when in full anthesis 6 cm thick; flowers odorless, promiscuously scattered, the lower ones subtended by a lanceolate to setaceously pointed bract, in pairs, the common pedicel in the bud state 4 mm long, the individual pedicel 8 mm long, both elongating to twice their length in full anthesis, pulverulent, at the base somewhat compressed; buds globose, 4 mm in diameter; perianth segments 4, valvate and in the bud state well overarching the anther head, persistent and subreflexed after bloom, united at the base, leathery, glabrate or pulverulent on both sides, oblong, 5 mm long by 3 mm wide, obtusely rounded at the apex, occasionally unequal in width; style or stamineal tube 6 mm long, terete, glabrous, fleshy, 1 mm thick; stamens about 8, conglomerated into a flattened mass nearly 3 mm across; anthers attached along the inner side, their cells well separated, membranous, light yellow, opening along the outer free edge, both the upper and lower ends notched or emarginate. Capsules not seen.

Type specimen number 12705, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September, 1912.

Found among the moss laden cold and windy forested ridge at 5750 feet altitude along the newly cut trail from lake Danao to the summit of mount Urdaneta or Masay as the natives call it. The Manobos named this as well as all other pitcher plants "Lapsay."

As to our Philippine species it is quite closely related to *Nepenthes merrillii MacF.* from Surigao province. In the eight specimens distributed, four were taken from a sterile plant and had considerable shorter leaves than those as here described and which may not belong to this species. In the summit region of Urdaneta or above 5000 feet there are three or more distinct terrestrial species, while on Cawilanan and Duros peaks at a lower elevation there is the high epiphytic species *Nepenthes truncata MacF.*

OLACACEAE

Erythropalum grandifolium Elm. n. sp.

Tree climber; stem 2 cm thick, very flexible, mostly branched toward the top, crooked and occasionally nodulose; wood soft, greenish, with a relatively large white pith, fresh turnip odor, sweetish or tasteless; bark yellowish brown, dotted with white lenticels; twigs slender, sparingly rebranched, the free ends drooping, glabrous. Leaves glabrous, diverse in size but not in shape, submembranous or membranous, of a shining rich green above, glaucescent beneath, horizontal or descending, nearly flat, triangularly ovate, entire, gradually tapering to the acute to acuminate apex, base broadly truncate, alternatingly scattered, just barely peltate, the larger blades 2 dm long by 1.5 dm wide toward the base, often much smaller, occasionally with a tough tendril from the axil; midvein bold beneath, yellowish green, with 1 or 2 basal pairs, upper lateral 3 to 5 pairs, the basal ones widely divergent and at least the upper or larger pair repeatedly forked from below the middle along the lower side, the lateral pairs also branched and coarsely anastomosing, cross bars and reticulations few, plainly visible from both sides; petiole from 3 to 10 cm long, green, glabrous, slightly thickened and twisted at the base, attached 3 mm above the basal margin of the blade. Infrutescence axillary, shorter than the foliage. upon slender green subpendulous very sparingly branched stalks, bearing few fruits at their ends; fruits ellipsoid, glaucous and red, nearly 2 cm long, 1.25 cm thick across the middle; their pedicels similar in color, very slender, straight, gradually thickened toward the distal end, 3 cm long, usually subtended at the base by bracteoles.

Type specimen number 12474, *A. D. E. Elmer*, Magallanes (Mt. Giting-giting), Island of Sibuyan, May, 1910.

Collected in fertile humus covered soil of dense woods at 750 feet altitude.

It seems to differ from the bulk of other Philippine specimens by its membranous not coriaceous leaves which average twice as large on our material and whose petioles are proportionately longer. I do not know if *Erythropalum scandens Blm.* occurs in our archipelago but our specimens are certainly not of the common smaller leafed plant.

Platea apoensis Elm. n. sp.

Large tree; trunk 1 m thick, 15 or more m high; wood odorless and tasteless, white, soft throughout, very light and splendid for cutting purposes; bark mottled, smoothish; branches widely spreading, the ultimate ones rather numerous and their young tips testaceus scurfy. Leaves quite numerous, alternate, chartaceous, dark olive green on the upper glabrous and minutely honeycombed surface which in the dry state is murinus, beneath minutely scurfy and avellaneus or ashy gray when dry, the larger blades 1 cm long by one half as wide across the middle, base broadly obtuse or rounded, apex bluntly obtuse, the entire margins curved upon the under side, elliptically oblong; midvein stoutly raised beneath, deeply sunken above, also scale covered in the early state beneath; lateral nerves 5 to 7 pairs, oblique, tips gradually becoming obsolete, otherwise similar, reticulations none or very obscure; petiole deeply channeled along the upper side, 1.5 cm long, the brown scales wearing off with age. Peduncles usually solitary, 2 to 3 cm long, suberect, covered with testaceusly covered scales, axillary; fruits 2.5 cm long, ovoidly ellipsoid, reddish, few, alternatingly scattered; fruiting calyx 5 to 8 mm long, stipitate except the short rounded lobes.

Type specimen number 11412, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, September, 1909; also numbers 10875 and 10582 from this same locality.

Here and there scattered in dense humid forests at 4000 to 6000 feet altitude. This also the natives or Bagobos call "Calisan."

The type number of this species is somewhat different than the other numbers cited.

Platea fuliginea Elm. n. sp.

A tree of middle size, its stem 4.5 dm thick, 10 to 15 m high; bark comparatively smooth except for the lenticels; wood soft, easily cutting, whitish throughout, odorless and tasteless, light; branches spreading, freely rebranched, the twigs densely covered with a fulvus or fuligineus stellate tomentum. Leaves alternatingly scattered, similarly spreading, submembranous, dark dull green above, yellowish gray or green beneath, nearly flat, the sharply acute to acuminate tips slightly recurved, the glabrous upper side nearly ater when dry, the lower surface avellaneus and fuligineusly finely stellately tomentose, entire, rounded at the base, ovately oblong or merely oblong, variable in size, the larger blades 1 dm long and one half as wide; midrib rather prominent beneath, densely covered with groups of fine fuligineus colored stellate hairs, glabrous along the small groove on the upper side; lateral nerves oblique, 7 to 10 pairs, similar in prominence and vestiture on the nether surface, tips strongly arching yet scarcely united, reticulations faint; petiole 1.5 cm long, fuligineusly pubescent or stellate, flattish on the upper side. Infrutescence erect, 1 to 3 cm long; spike stout, light fuligineus tomentose, bearing few scattered fruits; pedicel similar in vestiture, usually bracteate; calyx less than 5 mm deep, subcampanulate, united below the middle, otherwise roundly 5-lobed; young fruits ovoidly elongated, smooth, light green except the elongated darker green apex, shining, 1.25 cm long or when mature twice as long and red in color.

Type specimen number 10613, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, May, 1909.

Quite a fine forest tree in good rather moist soil at 5000 feet altitude and due south of mount Calelan. Fairly well known to all Bagobos as "Caliso."

Only critically distinguished from *Platea latifolia Blm.* by the smaller leaves whose nerves beneath are not "griseo-lepidotis."

OLEACEAE

Jasminum apoense Elm. n. sp.

Scandent and shrubby; branches terete, wiry, covered with yellowish brown bark coarsely checked longitudinally; twigs smooth, greenish, glabrous, dark brown when dry. Leaves opposite, widely scattering, horizontal, glabrous, sublucid on both sides though darker green on the upper nearly flat surface, curing equally dark coffee brown on both sides, oblong, the blades 9 to 13 cm long by 4 to 5 cm wide across the middle, the entire margins subinvolute in the dry state, obtuse to subacute at the apex, base obtuse to obtusely rounded; petiole ascendingly curved or even twisted, 1.5 to 2 cm long, widely and shallowly grooved along the upper side, glabrous, blackish brown when dry, comparatively thick; midrib deeper brown and prominent beneath, plane above or caniculate toward the base; the basal lateral pair of the nerves arising from the base and running 5 mm below the edge and connecting the upper 3 to 5 lateral pairs of nerves, all lateral ones relatively faint, no cross bars nor reticulations. Inflorescence chiefly from the upper leaf axils, seldom from the axils of the branchlets, 1.5 to 2 dm long, ascending, usually few branched, relatively short or 2 to 3 cm long, bearing toward the distal end 3 flowers, subcompressed, shining and deep brown when dry as is also the rachis, subtended by a minute bract; flowers sessile and subopposite toward the top of the very sparingly branched panicle, 1 to 2 or 3 from the distal ends of the branches according to size, also subtended by bracts of a smaller size; calyx short cup shaped, 5 mm across the 5 apiculately pointed apex, at the base abruptly constricted into a 2 cm long pedicel-like stalk, glabrous, coriaceous, minutely gland dotted especially toward the top; corolla 3 cm long, more than one half of the basal portion tubular, the 5 lobes rotately spreading, glabrous, creamy white, tube terete and 5 mm thick; lobes oblong, nearly 1.5 cm long, one half as wide, truncately rounded at the apex, at the base somewhat constricted and the sides sublobate, imbricate in the bud state; stamens 2, included in the corolla tube; anther 6 mm long, subterete and much elongated, notched at the base, slenderly acute to acuminate at the apex; filament 1 mm long, nearly as wide, glabrous, inserted upon the corolla 5 mm from the base, longitudinally dehiscent along the inner edge; style also glabrous, the basal two thirds slender and terete, much expanded toward the apex, terminated by a thick blunt stigmatic point, equalling the throat; ovary glabrous, bluntly conical, 3 mm either dimension.

Type specimen number 11953, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, September, 1909.

Gathered among shrubs of dense humid forests at 4500 feet altitude along the trail to Talon to the south of mount Apo. The Bagobos named it "Solo-solo."

Allied to *Jasminum crassifolium Blm.* and *Jasminum trinervium Merr.* From the former it differs in its lateral basal nerves arising from the base of the blade; from the latter in its different calyx teeth and corolla lobes as well as in other characters.

Jasminum rotundifolium Elm. n. sp.

Scandent shrubs; branches terete, green, wiry, inclined to twine, glabrous, flattened at the point of branching, sublucid, deep brown when dry; twigs opposite, even the young portion glabrous. Leaves also opposite, coriaceous, shallowly conduplicate on the upper dark green and shining surface, beneath much paler and duller, the very small apical point recurved, usually rounded or only the smaller ones obtusely rounded, the base very broadly rounded, orbicular to rotund or the smaller broadly elliptic, exceedingly variable in size, the larger ones nearly 1 dm across either way, entire, glabrous, widely scattered, curing nearly equally brown on both sides; petiole of the larger leaves 2 cm long, those of the smaller leaves only one half as long, reddish dark brown when dry, widely grooved along the upper side, relatively thick and very stout, curved and twisted; midrib raised beneath, plane above, straight from the sunken base to the apical point, with 3 to 5 pairs of secondary lateral pairs between the middle and the apex and which are relatively faint and straight; the main basal pair of lateral nerves arising about 3 mm above the base of the lamina, gracefully curved and extending into the apex, usually with a faint basal pair, cross bars and reticulations obsolete. Inflorescence not collected. Infrutescence 2 dm long on an average, axillary or terminal, suberect, very few and paniculately branched above the middle or toward the end; stalks relatively short, subcompressed, green though dark brown when dry, glabrous as well as the peduncle, in the early state subtended by minute linear bracts; fruits usually 3-clustered from the ends of the longer or lower branches, the upper shorter branches with fewer fruits or the apical fruits arising from the rachis, subtended by similar bracts; pedicel-like stalk or constricted portion of the calyx at least 3 cm long, slightly enlarged toward the distal or fruit bearing end, otherwise brown, thick, truncate at the apex and only minutely 5-apiculate, cup shaped, 7.5 mm long or high, 1 to 2 mm narrower across the top, in the fruiting state torn open along one side though persistent; corolla bud elongated, white, the lobes strongly imbricated. Mature or nearly mature fruits shining, green and finally purple red, usually in divergent pairs, containing green cotyledones, ellipsoid, 1.5 cm long.

Type specimen number 10571, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, May, 1909.

Collected in the dense secondary forests of a ravine on the south slope of mount Calelan at 4000 feet altitude. The Bagobos call it "Allok" and it formed tangled masses among the branches of a *Glochidion* species.

It is not the preceding species. Neither is it *Jasminum crassifolium Blm.* whose leaves are described as "ovalibus" and the young branches "glanduloso-pilosiusculis."

OROBANCHACEAE

Christisonia wightii Elm. n. sp.

Terrestrial and saprophytic, succulent; stem erect, short, solitary or usually few branched and much winged toward the top, 5 cm long, occasionally forming clumps, 1 cm thick, striate, glabrous, dirty yellowish white or brown, the longer curved, enveloped with similarly colored and glabrous imbricating scales of diverse sizes and shapes; bracts or scales toward the base short and scattered, those at the top much longer and well imbricated; branches commonly 3, arising from near the same place toward the distal end of the short thick stem, all densely surrounded at the base by numerous broadly oblong scales, very short and equally provided with imbricating scales especially toward their distal ends which bear either one or more terminal and erect flowers. Flowers odorless, protruding above the humus ground layer; bract subtending the calyx 1.75 cm long, 1.25 cm wide, coriaceous, glabrous, elliptic in outline, chiefly covering over the upper side of the calyx; calyx dark yellow or brownish, succulent, glabrous, subterete, nearly 2.5 cm long, 7.5 mm thick above the middle, a trifle narrower at the base, throat oblique and well slit open from the lower side, the upper end very broadly toothed, lateral teeth smaller, the lower end minutely lobed or not at all, early decaying or withering and forming a slimy dirty watery mass; corolla white especially on the interior except a rather conspicuous blotch in the lower corolla segment, 5 cm long, 5 mm thick toward the base, gradually inflated toward the very oblique throat, protruding above the humus covered foliage on the ground, curved above the middle and always facing down hill, fleshy, 1.5 cm across the throat, glabrous; segments about 5, subequal, 2.5 cm across when in full anthesis, rotately spreading, suborbicular; stamens apparently as many as corolla lobes, included; filaments glabrous, ribbon-like, adnate except their distal ends above the middle of the corolla; anther block shaped, 3.5 mm long, subbasifixed; pistil glabrous, nearly 5 cm long; ovary ellipsoidly elongated, upon a concrete base; style subterete, equalling the corolla tube; stigma composed of 2 broad and fleshy lobes; ovules indefinite, dark brown, divided into 2 general masses.

Type specimen number 9510, *A. D. E. Elmer*, Dumaguete (Cuernos Mts.), Province of Negros Oriental, Negros, March, 1908.

Collected in rich damp ground among the tussocks of *Amomum fusiforme Ridl.* along the upper edge of a deep ravine at 1750 feet altitude. "Satagbak" in the Visayan dialect.

In *Zingiberaceae* a botanist must know how to unearth the flowers or fruits of certain species in the field. In this case the collector thought these flowers represented a wild species of ginger, so I was particular to locate its leaf bearing stems. Quoting from my field label,—"The clumps seem to lie loose in the fertile soil beneath the humus covering and no connection was found with other living plants." A specimen was however sent with my other *Zingiberaceae* to *Dr. Ridley* for determination and who pronounced it a species of *Christisonia*. Dedicated to *Robert Wight* who figures a number of species of this saprophytic genus in his Icones Plantarum IV. It is here for the first time reported from the Philippine Islands.

PITTOSPORACEAE

Pittosporum subverticellatum Elm. n. sp.

Small tree; stem 6 m high and 5 dm thick; wood quite hard, sappy white throughout, sweetish, odorless; bark grayish mottled, densely covered with large lenticels; branches numerous, forming an elongated crown, the twigs light gray and more or less lenticelled, the green young portion glabrous. Leaves coriaceous, lucid green on the upper folded surface, much paler green beneath, the short obtuse or acutely pointed apex recurved, usually arranged in subwhorls and becoming easily detached in the dull dry brown state, broadly oblanceolate for the smaller blades and obovately oblong for the larger ones, 1 dm long excluding the petiole and 4.5 cm wide above the middle but frequently much smaller, glabrous, the entire margins subinvolute when dry, cuneate toward the base; petiole 2 to 3 cm long, rather slender, canaliculate along the upper side; midvein ridged beneath; lateral nerves 5 to 7 pairs, oblique, tips becoming obsolete, reticulations minute and only evident from the nether side; bud bracts imbricate, linear and sharply pointed, hairy but soon wearing glabrous, very unequal. Inflorescence ascending or erect, axillary or interaxillary, also appearing subverticellate; peduncles solitary or few clustered, as long as the petioles, paniculately branched above the middle, at the base subtended by bud-like bracts, sparsely ciliate pubescent; pedicels 1 to 2 cm long, the lower ones occasionally rebranched, divaricate, slender, subglabrous, subtended by setaceous subpersistent bracteoles, the upper ones somewhat shorter; calyx pale green, campanulate, glabrous or pulverulent in the middle exterior region, 4 mm high, 3 mm wide, the 5 segments acutely pointed and about one third the length; corolla yellowish green or creamy white when old, 1.25 cm long, more than the lower one half tubular, glabrous; the 5 lobes oblong, roundly obtuse at the apex, strongly recurved when in bloom; stamens 5, alternating with the segments, barely exceeding the throat; filaments free, subcompressed, equalling the corolla tube, cremeus, smooth, strict; anther 2.5 mm long, linearly oblong, subbasifixed, deep yellow, sagittate at the base, minutely apiculate at the apex; ovary fusiform, olivaceus hairy or soon wearing glabrous, gradually extended into the shorter glabrous style, also cremeus; stigma slightly larger than its neck and lighter in color when dry, green when fresh. Young fruit green, bluntly oblong, 2 cm long by 1.25 cm wide across the middle, creased, 3 to 4 celled; cells with many flattened brown seeds in a slightly mucilaginous fluid.

Type specimen number 12054, *A. D. E. Elmer*, Magallanes (Mt. Giting-giting), Island of Sibuyan, March, 1910.

Collected in dry soil of light woods or in secondary forests at 500 feet altitude. Its foliage with twigs are used by the natives as a remedy for stomach ailments. The local Visayan called it "Amomunpon"

This species is quite similar to *Pittosporum odoratum Merr.* yet in my opinion specifically distinct by being glabrous, with subverticellate leaves whose petioles average twice as long and by its more paniculate inflorescence.

POLYGONACEAE

Polygonum apoense Elm. n. sp.

Single or in small tufts; roots ample, wiry; stems varying from 4 to 6 dm high or long, decumbent toward the base or inclined to crawl, the lower joints leafless and usually provided with roots, terete, herbaceous, green, old stems closely jointed, young stems distantly jointed, dull brown when dry, usually branched from near the base, the younger portion of the stem yellowish strigose; joints clothed with boot-like sheaths 1 to 1.5 cm long or those along the old stem withered down to a broad shallow cup, brown, truncate at the apex or nearly so, yellowish brown strigose especially toward the bristly top, submembranous. Leaves alternate, well scattered, obovate or obovately elongated, submembranous, spreading divaricately, flat, rich or deep green above, much lighter beneath, curing nearly equally dull brown on both sides, entire, glabrate above, minutely puberulent beneath or subglabrate, the average lamina 8 cm long by 3.5 cm wide above the middle, apex bluntly pointed and obtuse, base cuneate; petiole 1.25 to 2 cm long, deeply caniculate along the upper side, short strigose beneath, ciliate along the upper lateral margins; midrib puberulent on both sides, darker brown beneath, slightly raised also on the upper side especially toward the base; lateral nerves 7 to 11 pairs although with secondary intervening ones along the midrib, faint, ascendingly curved especially toward their distal ends, cross bars and reticulations quite numerous and very faint. Inflorescent spikes subterminal, erect, ascending, solitary or 2 to 3-branched from the base where it is usually subtended by small leaves, greatly varying from 1 to 3 dm long or even longer, very slender and usually strict, curing straw brown, sides fluted, puberulent, flower bearing from below the middle; flowers usually only one in anthesis at a time, odorless, light pink or roseus, erect, evenly scattered except toward the base; nodal sheath 3 mm long, brown, submembranous, truncate and obscurely pointed at the top, the outer portion more prominently pointed, glabrous on the inner side, dull yellowish brown ciliate on the outer side and along the upper edge; flowers 1 to 3 from each joint, each nodal group alternating with the adjoining ones; involucre surrounding the flowers brownish, more membranous than the sheath, 1.5 to 2 mm long, glabrous, more or less united below the middle or nearly free, the 3 to 5 lobes diverse in size and shape, usually oblongish, apex acute to subtruncate, each segment with a midrib; pedicel relatively stout, 2 mm long, also glabrous, compressed and obscurely winged, equalling the sheath, persistent, slightly thickened at the top; corolla or perianth exerted, recurved in the later state, 3.5 mm long, constricted at the base into a short pedicel-like stalk; lobes 4 or 5, united toward the base, imbricate, glabrous, unequal, obscurely veined, ovately elongated or oblongish, apex acute or narrowly obtuse, larger in the older flowers; ovary obovoid, 0.75 mm long; styles 2, fleshy, they as well as the ovary glabrous, gradually tapering toward the minute capitate stigmas; stamens about 5 or only 4, inserted below the middle of the corolla, the fertile ones alternating with glands at the point of insertion, chiefly alternating with the segments; filaments erect, glabrous, 1.5 mm long, gradually thickened from the apex toward the base; anther subbasifixed, notched at both ends especially at the base, ovately oval, 0.25 mm across. Old flowers or young fruits much recurved, the perianth segments enlarged and deeper red; ovary large, compressed and elliptic from the side view; styles elongated and recurved toward the stigmatic ends.

Type specimen number 10754 *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, May, 1909.

Discovered in rich soil of open glens of dense forests at 3750 feet elevation. The Bagobos call it "Carecut." A handsome species with deep purple red flowers.

PROTEACEAE

Helicia integrifolia Elm. n. sp.

A small sized and suberect tree; stem crooked, irregular, 2.5 dm thick, 7 m high or higher, branched from the middle; wood soft, radially marked, only the very thin sapwood white, otherwise nearly fulvus brown mottled, latericius beneath the epidermis; branches relatively short, ascending and crookedly rebranched, ridged, the ultimate ones glabrous and obscurely compressed at the point of the leaf attachment. Leaves ascending from the base, recurved toward the distal end, chartaceous, folded upon the darker green upper side, the young ones pale green and purplish tinged, curing unequally brown on the 2 surfaces, glabrous, the entire edges slightly involute in the dry state at least, rounded toward the apex and terminated by a short broad point, obovate or obovately elongated, opposite, the average ones 2 dm long by 8 cm wide above the middle, cuneate at the base, the margins perceptibly decurrent clear to the swollen basal portion of the potiole; midrib stout, ridged along both sides, dull reddish brown; lateral nerves lighter brown especially on the upper side, relatively prominent, much ascending and curved toward their distal end, about 7 pairs although the basal 2 pairs are faint, tips anastomosing; cross bars few, reticulations more numerous, both quite evident from both sides; petiole 1 cm long, the sides with a narrow lamina portion, the basal one half much enlarged and dark when dry, glabrous. Spikes terminal, axillary or lateral, much recurved, varying from 1.5 to 4 dm long, usually solitary; rachis glabrous, when fresh dark bluish on the exposed sides, curing black, terete, the young apical portion puberulent; flowers irregularly scattered from near the base, odorless; pedicels in pairs, 4 to 5 mm long, 1 mm thick, sparsely strigose, subdiscoid at the distal end, each with a small bract on the outer side below the middle, falsely united at the base; perianth 2 cm long, cylindric in the bud state, apex much enlarged and ellipsoid, base only obscurely swollen, becoming easily detached; segments valvate, first becoming separated below the middle, 4, ultimately separating the full length toward the apex and the lobes settling about the base in a curved and twisted manner, the apical portion oblong and obtusely pointed, glabrous, coriaceous; stamens as many as perianth lobes, inserted upon the perianth in the bulged apical portion, opposite the segments; filaments adnate, compressed, glabrous, inserted 3.5 mm below the apex of the perianth lobes; anther 2.5 mm long, narrowly oblong, the thick connective convex along the dorsal side and terminated in a blunt somewhat inwardly curved point, the comparatively thin cells opening along the inner side, 1 mm wide above the middle of the widest portion; ovary fusiform, 2 mm long, glabrate, surrounded at the base by 4 more or less quadrangular thick and glabrous plate-like segments; style also glabrous, slender, as long as the perianth or a trifle longer; the stigmatic portion distinctly clavate.

Type specimen number 13392, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, July, 1912.

Inhabiting moist well drained soil of a forested ridge at 2500 feet altitude on Giwantanan knoll. According to the Manobos its vernacular name is "Salimay."

Near to *Helicia integra Merr.* though with larger leaves which are not oblong to lanceolate and whose nerves and cross reticulations are more prominent.

RANUNCULACEAE

Naravelia antonii Elm. n. sp.

A medium sized tree climber; old stem 2.5 cm thick, subterete; wood tissues in radial yellow and white sections, pith large and white; bark very dull or dark brown and more or less checked longitudinally, thick, of the wood color except the surface; branches green, slender, the free ends drooping, the tips glabrous and glaucous green, terete and striate, very tough. Leaves leathery, ovately elongated, opposite, deeply folded upon the upper slightly greener side, ater on both sides when dry, radially spreading, entire, truncately rounded or shallowly cordate at the base, gradually tapering to the bluntly rounded point which frequently becomes emarginate, 3-foliate, the average lamina 12 cm long by 6.5 cm wide below the middle, glabrous even when young; midrib straight or nearly so, quite evident beneath, also nearly black when dry, with 2 or 3 pairs of lateral veins, all arising from near the base, the basal pair faint and relatively short, the next and inner pair much ascendingly curved and along the outer side connected with faint cross bars, reticulations none; petiolule 2 to 3 cm long, ascendingly curved from the base, often twisted or tendril-like, subterete, brown to black and curved, succulent and green in nature; petiole divaricate, 1 dm long or shorter, terete, wiry, flattened and expanded toward the base. Flowers not seen. Panicle from the leaf axils; peduncles occasionally tendril-like, very strong and wiry, straw brown, the branched portion as long or longer; branches opposite, widely spreading but only sparingly rebranched, subtended by persistent bracts; pedicels verticellate toward the ends of the larger branches and few to severally clustered toward the distal ends of the ultimate branches, 3 to 6 cm in length, slender, straw brown on the dry specimens, also subtended by minute persistent bracteoles, subterete and finely striate, almost straight, nearly glabrous, thickened toward the distal end; receptacle conical, ciliate pubescent; achene compressed, reddish brown, cinereously hairy, 5 mm long, elongated and pointed at both ends with a 5 to 8 cm long silky coma which forms a globose mass of gracefully interlaced soft hairy tails.

Type specimen number 12734, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September, 1912.

Climbing along small trees and then sprawling over their tops along a wooded ridge at 3500 feet altitude of Duros peak. Named after *Anton D. Elmer* our son. Called "Obanon" by the Manobos.

Its relation seems to be with *Naravelia uncinata Cham.*

RHAMNACEAE

Gouania microcarpa subglabra Elm. n. var.

A scandent shrub; stem flexible; wood greenish; twigs green, terete, slender, somewhat drooping, the young portion olivaceus puberulent. Leaves chiefly descending, conduplicate on the upper dark green and lucid side especially so toward the recurved acute to acuminate apex, much paler green or subglaucous beneath, broadly or truncately rounded at the subentire base, otherwise minutely serrate or apiculately dentate, glabrous except the nerves beneath, much varying in size, ovately elongated, the average blades 8 cm long by 4 cm wide toward the base, alternatingly scattered along the twigs, curing unequally brown on the sides; midvein olivaceus strigose on the nether leaf surface, glabrous and minutely caniculate on the upper side; lateral nerves about 5 pairs, much ascending, tips extended along the edges, also conspicuous beneath and similarly hairy, the basal pairs 3-branched along the lower side, the apical pair subparallel to the midvein, cross bars or reticulations fine and very obscure; petiole 1 cm long, at first olivaceus pubescent, soon becoming glabrate. Inflorescence greenish throughout, when dry short olivaceus pubescent or puberulent; spikes solitary or few clustered, terminal or from the uppermost leaf axils, very slender, 2 to 3 or more dm long, usually leaf bearing toward the base; fruits scattered, solitary or 2 to 3-clustered; pedicels slender, 3 mm long, soft pubescent, subtended at the base by 1 or more bracteoles; carpels 3-winged, 5 mm high or long, 5 to 8 mm wide, dry and glabrous.

Type specimen number 11308, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, August, 1909.

Collected among jungled tree tops in the humid woods at 3750 feet elevation and along the Baruring river trail to Talon. "Solo-Solo" is the Bagobo name.

Possibly this plant should be considered a new species rather than a variety of *Gouania microcarpa DC.*

ROSACEAE

Photinia urdanetensis Elm. n. sp.

An upright and tree-like shrub; stem terete but crooked, 1 dm thick at least, 5 m high, branched from the middle; main branches crooked, rigid, ascending, rebranched toward the top; wood very hard, heavy, odorless and tasteless, incarnatus on the outside, the heartwood atropurpureus; twigs quite numerous, lax, relatively short, terete, the young apical portions tawny pubescent, drying similar in color, relatively short. Leaves very numerous, opposite, rigid, mostly horizontal, the acute to acuminate apex recurved, flat otherwise, lucid dark green especially above, paler green beneath, deep brown when dry, obtuse at the base, entire margins subinvolute in the dry state, from 3 to 5 cm long, 1.5 to 2.5 cm wide across the middle or just below it, elliptic or ovately so, the smaller ones broadly lanceolate and terminal, dark fulvus hairy when young, becoming entirely glabrous; midrib prominent beneath, plane above; lateral nerves oblique, very obscure from the nether minutely punctate side, 13 to 17 main pairs, cross bars or reticulations obsolete; petiole subcompressed, 3 mm long, relatively very thick. Panicle erect, 3 to 5 cm long, terminal or also from the uppermost leaf axils, very short branched toward the top; peduncles strict, striate, 2 to 3 cm long, fulvus pubescent; flowers odorless, few clustered from the ultimate branches, ascending in the bud state, when in anthesis usually recurved; pedicles 5 mm long, finely pubescent, at about the middle bearing a whorl of 3 bracts; bracts varying from 1.5 to 2.5 mm long, oblong, obtuse at the apex, rigidly chartaceous, similarly pubescent; calyx 4.5 mm high and nearly as broad, broadly cup shaped, puberulent or finely pubescent on the back especially the 5 segments; segments very broadly ovate, rigidly coriaceous, less than 2 mm long, 1 mm wider; petals as many as calyx lobes and alternating with them, coriaceous, 2.5 mm long and as wide, broadly ovate, puberulent on the dorsal side of the middle portion, with few punctate glands above the middle only, cuneate toward the truncate base, widest across the middle; stamens about 10, erect; filaments from 1.5 to 3 mm long, glabrous, subterete, pointed at the apex, widest below the middle and inserted upon the rim-like base; anthers subdorsifixed, oblong, 0.5 mm long, with a pointed apex, base broadly rounded and minutely notched; ovary surrounded by a glabrous rim, compressed globose, less than 2 mm across, minutely pubescent, brown when dry, bearing a mucronate nearly black and glabrous stigma.

Type specimen number 13694, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September, 1912.

Discovered among the low rigid woods along a wind swept cold and mossy ridge at 5500 feet of mount Urdaneta or Masay as the natives call it. Named "Sambolanan" by the Manobos.

RUBIACEAE

Amaracarpus apoensis Elm. n. sp.

Lax shrub less than 2 m high; stems and branches greenish, quite rigid, the latter numerous and widely spreading horizontally; twigs numerous and slender, latericius pubescent especially the young tips. Leaves also horizontally spreading, lucid and bright green above, much paler beneath, flat, membranous, glabrous except the nerves on the nether side, drying equally dull or dark reddish brown on the sides, opposite, regularly scattered along the twigs, frequently with one or a pair of smaller leaves in the axils, 2 cm long, 7.5 mm wide across the middle or above it, elliptically oblong or ovately so, entire, the axillary ones much smaller and even bract-like, obtuse at the apex, base acute or broadly cuneate; midvein conspicuous beneath, reddish brown hairy especially when young; the larger blades with 4 pairs of lateral nerves, quite evident from beneath, divaricate and ascendingly curved, tips conspicuously interarching and united, reticulations none, similarly hairy; petioles very slender, reddish pubescent, varying up to 5 mm in length; stipule subglabrous, 3 mm long, truncate except the seta-like bristles on each side, rather rigid. Flowers axillary, ascending, 1 to 3-clustered, greenish white except the green calyx tips; peduncle very short and subtended by a pair of foliaceous bracts; pedicel thick, 1 mm long, densely brown hairy; calyx 4 mm long, the 4 segments united at the base or toward it, narrowly oblong, glabrous or only strigose in the sinus between the lobes; corolla elongated or tubular, white, glabrous except the throat, 4 mm long, the basal one third united and more or less constricted; oblongish segments also 4, thick, valvate, obtuse, tips incurved, at least 1 mm wide; stamens of an equal number, alternating with the segments and inserted upon the throat or to some extent in the tube; filaments glabrous, slender, 1.5 mm long; anther compressed, oblong, introrse, nearly 1 mm long and one half as wide; ovary superior, truncately globose, glabrous, 0.75 mm in diameter; style 1 mm long, slender, strict, also glabrous, forked at the distal end; fruit 5 to 6 mm long, 4 mm thick a trifle above the middle, obovoid usually, roundly truncate at the apex and calyx still intact, sharply pointed at the base, at first hairy, ultimately glabrate, prominently rugosely ridged when dry.

Type specimen number 10737, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, May, 1909.

This rare undershrub was discovered in very rich moist soil of dense forests at 3500 feet altitude along the southern side of the Baruring river. The Manobo name is "Poagan."

Distributed as *Amaracarpus microphylla Miq.* and so reported it on page 1036 of this publication. *Dr. Valeton* kindly informs me that it differs from *Miquel's* species in having distinct petioles and whose flowers are not at all bell shaped. It is most closely related however to *Amaracarpus brauniana (Warb.) Val.* of New Guinea.

RUTACEAE

Clausena todayensis Elm. n. sp.

Tree, with a 10 m high and 3 dm thick stem; bark mottled, smooth and brown on the branchlets, rank bitter; wood yellowish white, moderately hard and heavy, odorless but with a bitterish taste; twigs roughened with lenticels, puberulent when young. Leaves imparipinnate, thinly coriaceous, paler green beneath, dark green on the upper conduplicate surface, the acute to acuminate tips strongly recurved, alternating along the branchlets, curing light beneath and dark blackish brown above horizontally spreading, 5 to 7-foliate; peduncle terete, 1.5 cm long, puberulent, the internodes about as long and similarly hairy; leaflets punctate beneath, slightly unsymmetric, oblongish, entire toward the base, obscurely crenate or undulate, the base obtusely rounded, the terminal leaflet the larger, the basal pair subopposite and much reduced, the larger ones 7.5 cm long by 3 cm wide at the middle, sparsely pulverulent or puberulent on both sides; lateral pairs 5 to 9, divaricate, also black on the nether side, straight, their ends more or less archingly united few mm below the edge, reticulations coarse especially toward the ends of the nerves; petioles only a few mm long, the terminal leaflet upon a 1 to 1.5 cm long rachis extension. Inflorescence ascending, terminal, paniculate, 1 to 2 cm long; all the stalks terete, green, brown puberulent, the lower or longer branches repeatedly rebranched from below the middle, the ultimate branchlets subtended by minute bracts; flowers solitary or usually in small terminal clusters, subtended by a bract-like rim which is finely ciliate along the margins; pedicel 1 mm long, relatively thick; sepals 4, cremeus, caducous, elliptically oblong, 3 5 mm long by one half as wide across the middle, margins hyaline, densely sprinkled with purple or reddish brown, the middle portion with a few large pellucid glands, unequal in width but not in length, glabrous, deeply concave on the ventral side, just inside of this whorl of organs is a saucer shaped whorl of persistent organs 1.25 mm high and with 3 to 5 finely ciliate blunt teeth; stamens 8, erect; filaments 2 mm long, fleshy, compressed, purplish brown sprinkled, pointed at the apex only, ovate or ovately oblong in shape; anther 1.5 mm long, truncately oblong, emarginate at the apex, the basal one half divided, attached in the sinus; ovary more or less rugose, 2 mm long, short stipitate, obscurely 4-angled and with some large glands, terminated by a circular stigma.

Type specimen number 10530, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, May, 1909.

On a densely wooded ridge south of the Sibulan river at 1500 feet altitude. "Dangolais" is the native or Bagobo name.

Evodia arborea Elm. n. sp.

A middle sized tree; stem 6 dm thick, terete, more or less crooked, 14 mm high, branched mainly at the top; wood soft in texture, light in weight, both odorless and tasteless, white except the dingy or yellowish or even yellowish gray epidermis; main branches widely spreading, freely rebranched and forming an umbrella shaped crown; twigs ascendingly curved, glabrous at the young tips, grayish green, compressed at the leaf insertions. Petioles also green, horizontally spreading, subterete, 5 to 8 cm long or the smaller leaf petiole shorter, glabrous, blackish brown when dry, leaving large scars after falling; leaflets trifoliate, thinly coriaceous, horizontally spreading, very unequal in size, glabrous, conduplicate on the upper sublucid side, beneath a shade lighter green, curing darker brown on the upper surface, the entire margins subinvolute when dry, apex abruptly terminated into a short recurved point, base broadly obtusely rounded, elliptic, greatly varying in size, the larger lamina 12 cm long by one half as wide across the middle, the smaller leaflets one half as large; midrib plane above, prominent beneath, darker brown than the leaf sides in the dry state; lateral nerves 10 to 15 pairs, divaricate, ascendingly curved toward the disappearing tips, reticulations very minute; petiolule 5 mm long, similar in color and glabrous, ascendingly curved, only very shallowly grooved along the upper side. Inflorescence erect from the uppermost leaf axils, paniculate, 5 cm long or much shorter, commonly branched from above the middle or from near the base, usually solitary but when branched opposite, relatively short and cinereous; branches subtended by small bracts, appearing thickened toward their distal ends, the ultimate ones more densely cinereous or subolivaceus tomentulose; flowers pure white, with a sweet anise odor; pedicels clustered toward the ends of the ultimate relatively thick branchlets, 2 mm long, usually somewhat curved, olivaceus puberulent, subtended at the base by short thick and similar pubescent bracts; calyx 4-segmented, rotately spreading, persistent, united at the base; segments ovately triangular, 1 mm long, on the back toward the base finely puberulent, on both sides with large lighter colored punctate glands, obtusely rounded at the apex; corolla bud rugosely ellipsoid, valvate; petals as many as calyx segments and alternating with them, more numerously gland punctate above the middle, glabrous, inwardly curved and more or less twisted, submembranous, nearly as wide across the base; stamens 4, alternating with the petals, similarly curved; filaments 2.5 mm long, glabrous, flattened and widest toward the base; anther elliptic from the side view, 1 mm long, dorsifixed or versatile, notched at both ends, the cells longitudinally dehiscent and well separated;

ovary compressed, densely hairy, 4-rugulose, at the middle bearing a short glabrate and erect style.

Type specimen number 13159, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, May, 1911.

This fine tree species was collected in damp forests of fertile soil along the trail to Napsan at about 750 feet above sea level.

Its relation is with *Evodia semicarpifolia Merr.* and *Evodia glabrum Blm.* though especially related to the latter.

Evodia benguetensis Elm. n. sp.

Suberect, small tree or shrub like; branchlets erect, rather numerous, yellowish gray, the green terminal or leaf bearing portion glabrous, roughened more or less by the leaf scars. Leaves 3-foliate, similarly disposed, oppositely crowded, 6 to 9 cm long, glabrous even in the young state; petiole 2 to 3 cm long, ascending, drying brown, rather slender, subterete, larger leaflets 6 cm long and 2 cm wide above the middle, obovately oblong, apex rounded and occasionally emarginate, base cuneate, the lateral ones frequently inequilateral, callous margins entire and rather conspicuously recurved upon the nether side, drying unequally green or brown on the 2 sides, rigidly chartaceous, subsessile or upon a very short petiolule, articulated at the base, deeper green and sublucid on the upper side; midrib ridged beneath, caniculate above, smooth and more yellowish green or brown; lateral nerves about 10 on each side, very obscure, divaricate, their ends forming a submarginal line, reticulations quite evident from the lower side only. Inflorescence 2 to 3 or even 5 cm long, branched above the middle, arising from the uppermost leaf axils, erect or ascending; peduncle 1.5 to 3 cm long, strict, glabrous, striate or subcompressed; branchlets opposite, the lower or longer ones subtended by obovately elongated perfectly glabrous green bracts; flowers more or less clustered toward the distal ends of the ultimate branchlets; bud pedicels very short, relatively thick, subtended by blunt bracteoles; flowers usually in groups of 3, subtended by vestiges of bracts; pedicels 2 mm long, glabrous; buds subglobose; calyx green, 1 mm long, 4-toothed, the greenish glabrous teeth obtuse; petals yellowish, also glabrous and of an equal number, ovate to elliptic, obtuse, 1.5 mm long by 1.25 mm wide below the middle; stamens 5, glabrous; filaments subterete, attached to the nether side of the ovary, at least 1.5 mm long; anther dorsifixed, oval, 0.75 mm long, deeply emarginate at the base; ovary disk-like, 1.25 mm across, with 4 sessile stigmas.

Type specimen number 14274, *A. D. E. Elmer*, Baguio (Mt. Santo Tomas), Province of Benguet, Luzon, March, 1912.

Collected along an open more or less rocky ridge trail at 6750 feet altitude. Along this same trail was seen a coarse *Anenome* in flower and the only thistle species of the Philippines.

Differs from *Evodia dubia Merr.* in being entirely glabrous, its leaflets broadest above the middle not at the middle and which are more obtusely rounded at the apex. Again, its leaflets are less than one half as large and foliage more numerous than in typical *Evodia retusa Merr.* Bureau of Forestry number 4965 from the same mountain is exactly our species in fruit.

Melicope mindanaensis Elm. n. sp.

A suberect tree-like shrub; stem 1.5 dm thick, 7 m high, mostly branched toward the top, crooked, subterete; wood white or yellowish tinged, light in weight, soft, tasteless, sweetly odorous especially in the branchlets; bark yellowish gray, smooth on the surface, otherwise yellow except the green hypodermis; main branches spreading, crookedly rebranched, the lax subdrooping twigs with ascending glabrous tips. Leaves unifoliate, opposite, profuse along the branchlets, coriaceous, ascending, glabrous, paler green beneath, curing equally brown on its sides, only shallowly conduplicate, smooth and shining as well as puncticulate on both surfaces, the average blades 1 dm long by 4.5 cm wide across the middle or above it, frequently much smaller, obovate or obovately elongated, entire, the margins subinvolute in the dry state, obtusely or broadly rounded at the apex, the young ones mucronate, the old ones usually emarginate, base broadly cuneate; midrib ridged beneath; lateral nerves 7 to 11 pairs, divaricate, their tips interarching and anastomosing, reticulations scarce toward the middle or midrib; petiole with petiolule ranging from 1 to 3 cm long, the basal two thirds terete, the apical or petiolule portion grooved along the upper side, the connective portion somewhat thickened and darker green, the petiole portion enlarged at the base and leaving large scars after falling. Panicle 5 cm long or shorter, solitary and mainly from the upper leaf axils, glabrate; branchlets from below the middle, opposite, divaricate, usually subtended by caducous and glabrous bracts; pedicel 1.5 mm long, easily separating, subtended by 3 apical bracts, all glabrous; buds ovoidly ellipsoid, 2 mm long; calyx punctate, 1 mm long, erect, united at the base, terminated by 4 acute teeth-like segments, also glabrous; corolla twice as long, equally as many, alternating with the calyx segments, oblongish, valvate but separating from the base toward the apex, obscurely punctate; stamens 6, sterile or nearly so; filament 1 mm long, linear, flattened, subhyaline, terminated by a very minute introrse basifixed anther, all glabrous, ovary short obovoid, glabrous, 4-lobulate; style very short, the brown stigma comparatively large and its 4 lobes rotately spreading, also glabrous. Infrutescence 3 to 8 cm long, branched from near the middle, divaricate; fruits dark green, conspicuously reticulate in the dry state, usually 1 to 3-clustered, subglobose though obscurely compressed, 4 mm across, persistent, apically dehiscent; seeds shining and nearly black.

Type specimen number 13844, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September, 1912.

Discovered in stony ground of a very steep wooded slope of Cawilanan peak at 4500 feet altitude. "Leiva-an" is the Manobo name.

This is at once distinguished from *Melicope monophylla Merr.* and from its new variety *glabra* by its glabrous and smaller leaves.

Melicope monophylla glabra Elm. n. var.

A small tree-like shrub; stem 13 cm thick, 5 to 7 m high, crooked, subterete; wood faintly yellowish tinged throughout, with a pleasant odor, tasteless, light in specific gravity; bark smooth and yellowish; main branches few and toward the top spreading not numerously rebranched; twigs slender, suberect, the green and glabrous terminal portion obscurely angular. Leaves ascending, opposite, coriaceous, flat, paler green beneath, glabrous, elliptically elongated, apex rounded, in the mature ones broadly obtuse, curing unequally brown on the 2 sides, entire, 2 to 2.5 dm long by 9 to 12 cm wide at the middle, often with much reduced leaflets, very minutely black punctate beneath; petiole stoutly raised beneath, brown when dry; lateral nerves 9 to 13 pairs, the basal 2 to 3 pairs much less conspicuous from beneath, divaricate, coarsely forked and reticulated toward their distal ends, occasionally with secondary intervening ones, the reticulations beneath rather coarse yet relatively conspicuous; petiole including the petiolule 2 to 4 cm long, the longer portion or the petiole proper subterete, green and glabrous, the petiolule portion flattened and grooved along the upper side, the jointed portion enlarged and deeper green in the fresh state. Panicle lateral or axillary, usually single, in the bud state 5 cm long; branchlets subtended by bracts, mainly opposite, in the early state densely yellowish puberulent; buds globose, clustered; pedicel 1 mm long or less, subglabrous, the bracts puberulent; calyx 1 mm long, cup shaped, the basal one half united, terminated by 4 blunt teeth, glabrous though somewhat punctate; corolla longer, alternating with the calyx segments. Fruiting panicle 3 times larger than the inflorescence, branched from below the middle; pedicels 3 mm long, at the base surrounded by scale-like bracts or bract vestiges, all the branches divaricate, flexible, pale green; carpels much deeper green, somewhat verruculose, 4 mm long, obscurely flattened, apically dehiscent, persistent; seeds solitary, 2 mm in diameter, subglobose, shining black, hanging for a considerable time from the opened capsule before falling.

Type specimen number 13897, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September, 1912.

Collected in wet rocky ground of densely wooded banks of the Catangan creek at about 3000 feet altitude.

Its entirely glabrous leaves mark it as a good variety from the type specimen of the species.

Murraya banati Elm. n. sp.

Shrubs; stem 5 to 10 cm thick, 3 to 5 m high, subercet, crooked and irregularly round, branched from below the middle; branches spreading, rebranched, the ultimate ones lax and descending; wood hard and heavy, yellowish throughout, finely grained in a parallel manner with the irregular surface, odorless and without taste; bark smooth, yellowish gray, avellaneus beneath the epidermis; twigs terete, the young green tips sparsely verrucose. Leaves descending, alternate, submembranous, nearly flat, the abrupt bluntly pointed apex recurved, the entire margins wavy, elliptic though usually the smaller ones ovately elliptic and the few larger ones obovately elliptic, composed of a single leaflet or alternatingly 2 to 3-foliate, varying from 1 by 3 cm large of the single leaf to the 5 by 10 cm large in the large obovate leaflets, base obtusely rounded in the ovately elliptic ones, broadly cuneate in the others, the terminal leaflet always much larger, glabrous, green in the dry state, minutely punctate on both sides; midrib conspicuous beneath, also green when dry; lateral nerves 5 to 7 on each side, oblique, anastomosing, reticulations evident; petioles also green even on the dry specimens, short, on the single leaves with the rachis varying from 5 to 15 cm in length for the 2 to 3-foliate leaves, glabrous but verruculose, upper side flat and laterally ridged, the lateral petiolule less than 5 mm long and darker green. Infrutescence laterally scattered along the branchlets, upon 1 to 2 cm long strict and verruculose peduncles; the peduncle at its distal end irregularly enlarged and bearing 1 to 3 fruits upon 1 cm long rather slender pedicels; fruits usually in pairs from the distal end of the green and flexible pedicels, pendant, fusiform, 2.5 cm long, sessile, soft, ruber red and with a sweet taste when fully ripe, 2-celled but usually with only a single seed.

Type specimen number 13947, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, August, 1912.

In moist stony soil along wooded banks of the Catangan creek at 750 feet altitude. The Manobos as well as the Bagobos call it "Banati."

The gnarly basal portion of the stem or root portion is highly prized by the Mindanao tribes for the material in making ornamental handles for their larger weapons and for sheaths of their smaller knives. It takes a beautiful yellowish polish and pieces with curved and twisted wood grains are exceedingly fine.

Apparently not one of the numerous forms under *Murraya exotica Linn.* but very close to *Murraya elongata DC.*, differing in the longer and more tapering fruits, leaves submembranous or chartaceous not coriaceous nor with notched tips.

Tetractomia philippinense Elm. n. sp.

Small tree or shrub-like; stem several to 8 dm thick, 5 to 8 m high, subterete, crooked, mainly branched toward the top; wood bitterish, yellowish white, odorless, moderately soft; bark comparatively thick, grayish white mottled, smooth, the inner portion yellowish; main branches ascending, repeatedly rebranched; twigs lax, suberect, their greenish tips glabrous. Leaves normally opposite, crowded toward the ends of the branchlets, thickly coriaceous, ascending, much lighter green on the nether side which is also more evidently punctate, glabrous, curing very unequally brownish on the upper and lower sides, apex rounded and terminated by a blunt point, base cuneate, entire margins subinvolute in the dry state, obovately oblong or merely obovate, the average blades 6 cm long by 2.75 cm wide above the middle, frequently much smaller; midrib prominent and reddish brown when dry; lateral nerves 4 to 6 on each side and occasionally with secondary ones intervening, subdivaricate, relatively much less prominent, the faint basal pair very oblique and parallel with the margin, their tips more or less interarching, reticulations obscure; petiole 0.75 to 1.5 cm long, subcompressed or its sides ridged, punctate, appearing articulated at the distal end. Inflorescence erect or nearly so, 3 to 5 cm long, glabrate, usually solitary from the upper leaf axils, few paniculately branched from above the middle; branches opposite, only the larger or lower ones rebranched, subtended by blunt glabrous bracts, bearing from the distal end 1 to nearly 3 odorless flowers; pedicels 2 to 3 mm long, glabrous, rather thick, subtended by a solitary or a pair of bract vestiges; calyx yellowish green, subcampanulately, glabrous, obscurely punctate, rigidly coriaceous, 1.5 mm across; the 4 segments united about the base, a trifle over 1 mm long, broadly ovate; petals cremeus, of an equal number, alternating with the calyx segments, in anthesis spreading, valvate, coriaceous, very broadly ovate, also glabrous, punctate, apex subacute, 1.5 mm long and equally as wide toward the base; stamens 4, alternating with the petals; filaments compressed, glabrous, gradually tapering from the base to the apex, 1 mm long at least; anther 0.6 mm long, elliptic, basifixed, base notched, apex truncately obtuse, sublaterally dehiscent; ovary crown truncate, glabrous, toward the center provided with 4 lighter colored cushion-like excrescences; style very short, stigma minute, all glabrous. Glandular capsule erect, 4-parted, rigid, glabrous, punctate; each division at least 3 mm long, oblongish, compressed though much thickened at the base, the apex 1.5 mm wide, inserted upon the apex and one third way down the dorsal side; inner carpel similar in shape, dehiscing along the suture all around, eglandular, hyaline and bony; ovules 2 in each cell, much flattened, sessile; seeds 2 but frequently only one maturing in each cell, 1.5 mm long, ovately elongated from the side view, compressed especially toward the apex which is extended into an oblongish wing as the seed itself, smooth, dark brown especially the seed portion.

Type specimen numbers 13702 and 13751, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September, 1912.

Both of the above numbers were collected in the cold moss covered and wind swept ridges between the summit peaks of mount Urdaneta at 5500 to 5750 feet altitude. The former number was named "Yadagon" while the latter number the Manobos called "Aliayan."

Quite distinct from *Tetractomia majus Hook.* and *Tetractomia roxburghii* of the same author, the only species hitherto known of this Malayan genus.

SABIACEAE

Meliosma tongcalingii Elm. n. sp.

A lofty tree; trunk 1.5 m thick, terete and straight, 20 m high at least; branches widely spreading, the young portion dark brown. Leaves 5 to 11 dm long, 12 to 20-pinnate, alternating toward the ends of the thick branchlets; leaflets subopposite, coriaceous, glabrous except the nerves beneath, the entire margins subinvolute, the recurved tip acute or abruptly acuminate, base rounded or subtruncate, ovately oblong, the basal ones much reduced, nearly 2 dm long and 7.5 cm wide below the middle, curing dull brown; midvein prominently raised beneath, fuligineus strigose even on the upper sunken side; lateral nerves 8 to 15 pairs, much ascending, tips faintly united, more numerous toward the base, divaricate, cross reticulations faint yet quite evident from both sides; petiolule similarly hairy, caniculate, 1 cm long; petiole proper 1 to 2 dm long, stout, terete or nearly so, brown, usually fuligineus puberulent, thickened at the base. Panicle terminal, creamy white or yellowish, 3 to 5 dm long, the main stalks as well as the branchlets densely covered with a short fuligineus pubescence; flowers solitary or in small groups, promiscuously scattered along the thick ultimate branchlets, sessile, subtended by short and similarly hairy bracts; buds obovoid, 2.5 mm long; calyx 1.5 mm long, erect and mostly united, obscurely 3-angled, truncate or minutely yet sharply 3-pointed, rigid, cup shaped; petals 3, valvate, thick, yellowish, also glabrous, slightly unequal in width, elliptic; stamens apparently only 2, glabrous, alternating with the petals, strongly inflexed from the apical end of the petaloid filament; anther introrse, broadly elliptic, nearly 1 mm long, wider, emarginate at the ends, ovary glabrous, ovoid and sharply pointed, subtended by a glabrous membranous rim or collar which is truncate or minutely pointed; the glabrous and expanded filament with a pair of projections from the base, the connective extended into a rigid point.

Type specimen number 11929, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, October, 1909.

Collected in moist rich soil of a densely forested sheltered place at about 3000 feet altitude along the trail from *Datu Tongcaling's* settlement to mount Calelan. Named after the Bagobo chief who called this stately tree "Magasorod."

SAPOTACEAE

Mimusops latericia Elm. n. sp.

An upright tree of middle size; stem terete though crooked, 2 to 3 dm thick, 12 m high, branched above the middle; wood very hard, burly, heavy, odorless and also without taste, the outer one third whitish, gradually changing to the incarnatus central mass; bark fumosus, deeply checked, testaceus except the epidermis and the inner whitish surface which exudes milky sap; main branches ascending, ultimately numerously rebranched; twigs terete, lax, suberect or ascendingly curved, their apical portion latericius lanose. Leaves descending, rigidly coriaceous, shining upon the upper deeper green and strongly folded side, duller beneath even in the dry state, curing dull or deep brown on both sides, chiefly toward the ends of the branchlets, alternate or in the early state subopposite, entire, oblong when old but the young leaves covered beneath with a deciduous latericius colored tomentum, much recurved toward the acute to subacuminate apex, base obtuse or obtusely rounded, variable in size, the larger blades 9 cm long by one third as wide across the middle; midrib prominent beneath, entirely glabrous when old, latericius pubescent beneath in the early state; lateral nerves oblique, faint, numerous, freely reticulated above the middle; petiole 1 to 1.5 cm long, nearly plane along the upper side, in the early state covered with latericius hairs, finally glabrous. Flowers divaricate, subpendant, usually solitary from the leaf axils; pedicels at first densely latericius tomentose, 1 cm long or longer, gradually tapering and becoming thicker toward the distal ends; bud ellipsoid, latericius tomentose; calyx very thick and rigid, united at the base, the 4 outer calyx segments 8 cm long and one half as wide below the middle, broadly lanceolate or ovately elongated, apex acute, the thinner edges involute especially toward the apex, light pulverulent on the ventral side, ascending; the inner series of 4 sepals puberulent especially on the outer side, alternating and inserted upon the concrete basal portion of the outer series of segments, similar in shape though somewhat shorter; petals about 24, most of the outer ones broadly lanceolate, the inner 4 twice as broad but not longer, all glabrous and finely veined, 6 mm long including the 1 mm long united basal portion, creamy white, erect, densely crowded and imbricate; stamens about as long; the basal 1 mm rim-like and concretely united with the corolla base, with 8 fertile stamens alternating with hairy sterile ones; filaments subterete, glabrous, at least 1 mm long, tapering from the base to the apex, erect, in the early state curved, anther at least 3 mm long, sagittate and basifixed, nearly 1 mm wide across the base, gradually tapering to the acuminate point, the outer side along the connective with few long hairs, laterally dehiscent; ovary bluntly conical, 3 mm long by 2 mm thick, hairy; style a trifle longer, glabrous, terete, obscurely curved, terminated by a truncate lighter colored stigma. Young fruits ovoid, 8 mm long and 5 mm thick, long latericius hairy, subtended by the rigid calyx.

Type specimen number 13010, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, April, 1911.

Collected in lightly wooded flats of black adobe soil at above 250 feet elevation.

This Palawan plant seemed quite distinct to me from *Mimusops elengi Linn.* collected in other localities. Its more numerous leaves are smaller and somewhat different in shape. Our specimens are densely latericius pubescent.

Palaquium cuprifolium Elm. n. sp.

Only a small upright tree; stem 1 dm thick, 7 m high, terete, branched from the middle; main branches widely spreading, only sparingly rebranched, the ultimate tips suberect, very rough and dirty scurfy; bark latericius except the brownish more or less scaling surface, with latex; wood soft, odorless and tasteless, white and reddish tinged toward the center. Leaves alternatingly crowded toward the ends of the branchlets, chartaceous, ascending, duller green on the upper side, curing dark copper brown on both sides, glabrous except the midrib, 3 to 4 dm long by 12 to 16 cm wide above the middle, the entire edges minutely involute in the dry state, obovately oblong or cuneate, broadly rounded at the top and usually with a short blunt point, occasionally inequilateral toward the cuneate base, the very young leaves very densely fulvus hirsute; midrib very thick and large beneath, in the early state subfulvus beneath, ultimately glabrous, flat and with a middle ridge along the middle, yellowish when fresh, dark brown when dry; lateral nerves 15 to 18 on each side of the midrib, oblique, straight, ascendingly curved toward the apex and the upper ones more or less united, very prominent beneath, cross bars oblique, faint yet quite evident from beneath; petiole at most 3 cm long, very stout, flat and compressed, striate along the upper side, yellowish gray pulverulent, after falling leaving raised scars; stipular-like bracts chartaceous, 1 cm long, nearly glabrous, oblong to elliptic, grayish when old. Flowers out of season. Infrutescence clustered immediately beneath the foliage; pedicels arising from short tubercles or coarse excrescences, 1.5 to 2 cm long, scurfy or yellowish pulverulent, slightly and gradually thickened toward the distal end, more or less striate; fruit green, ellipsoid, smooth, glabrous, 2.5 cm long, often a trifle flattened, subtended by the segmented calyx, normally with 2 large shining brown seeds with plane ventral side, often with only 1 ellipsoid seed with a dull longitudinal zone along one side.

Type specimen number 13263, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, July, 1912.

Gathered in humus covered clay of a forested ridge at 1000 feet height. Its Manobo vernacular name is "Tacan."

Quite different from my number 13896 or the following new species collected in this same general region. Neither is it

Palaquium gigantifolium Merr. in the leaves and stipular bracts.

Palaquium pinnatinervium Elm. n. sp.

Large and lofty tree; bole 10 dm thick in diameter, 20 to 25 m high, buttressed and almost entirely standing upon prop-roots, chiefly branched toward the top; main branches spreading and erect or ascendingly curved, numerously bracteate toward the glabrous tips; wood moderately hard, white though slightly reddish tinged toward the center, odorless, a trifle bitter; bark thick, reddish or purplish red toward the inner side, smooth and grayish brown on the surface, only roughened with longitudinal lines of excrescences, containing latex; bracts ovately lanceolate, 2 to 3 cm long, 1 cm wide across the base, greenish brown, strongly curved upward and twisting toward the acuminate point, usually a pair from each side of the petiole, glabrate. Blades 4 to 5 dm long and 15.5 cm wide above the middle, obovately oblong, broadly rounded at the apex, gradually narrowed toward the base or slenderly pandurate, at the base obtuse and 1 cm wide, entire edges subinvolute in the dry state, ascending, alternatingly crowded toward the distal end of the twigs, subchartaceous, shallowly folded upon the upper much darker green and glabrous surface, beneath finely yellowish brown puberulent or canescent; midrib yellowish green, similar in vestiture when young,' ultimately glabrate, very stout and ridged beneath, yellowish green in the natural state, dark brown when dry, flat and a trifle sunken along the upper glabrous side; lateral nerves pinnatinerved, of 25 slightly ascending pairs, yellowish brown canescent, tips ascendingly curved, relatively prominent, oblique cross bars very numerous and obscure; petiole broad and very thick especially toward the base, 2.5 cm long, flat along the upper side, glabrous, nearly black in the dry state. Flowers not found. Fruits clustered along the branchlets, hanging upon recurved 3 to 5 cm long greenish brown glabrous pedicels; nuts short ellipsoid, lucid green, 3.5 cm long by 1.75 to 2 cm thick, subtended by the obscurely 3-lobed persistent calyx.

Type specimen number 13896, *A. D. E. Elmer,* Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September, 1912.

Discovered in rocky ground of the densely wooded Catangan creek at 3000 feet altitude. The Manobo name is "Tagcan."

The nether side of the leaves of *Palaquium gigantifolium Merr.* is glabrous and whose apices are acute to obtuse not broadly rounded as in ours.

Payena fusicarpa Elm. n. sp.

A small or middle sized tree; stem 2 to 3 dm thick, 7 to 10 m high, subterete, branched from above the middle, quite hard, whitish, tasteless, with a faint pleasant woody odor, reddish tinged toward the center; bark brown and scaling in small plates, whitish on the inner side, with milky sap; main branches ascending, spreading, repeatedly and laxly rebranched; twigs also ascending or the outer and lower ones descending, the angular leaf bearing portion dark green and ascendingly curved. Leaves similarly disposed, chartaceous, alternate, darker green above, glabrous, the acute to acuminate apex recurved, occasionally obtuse at the apex, base obtuse or obtusely rounded, drying brown or blackish brown on the upper side, margins entire and when dry a trifle involute, oblong or the smallest ones broadly lanceolate to oblanceolate, the larger blades 2 dm long by 7 cm wide across the middle, the smaller ones less than one half as large, the slenderer tips subfalcate; petiole 2 to 3 cm long, caniculate along the upper side, glabrous, somewhat thickened toward the base, leaving raised scars after falling; midrib prominent beneath, shallowly grooved though with a ridge along the center on the upper side of the leaf, glabrous on both surfaces; lateral nerves 12 to 16 pairs, subdivaricate, ascendingly curved toward their ends and gradually disappearing, cross bars and reticulations obscure. Flowers odorless, in axillary clusters, upon 1.5 cm long glabrate to minutely puberulent recurved pedicels which are pale green and upon drying turning nearly black; calyx deep campanulate, 7 to 8 mm long, 5 to 6 mm thick, composed of 4 strongly imbricate segments or sepals; the 2 outer ones longer and broader, very thick and rigid, ventrally folded, appressed pubescent on the exterior, slightly so on the inner side, ovately elliptic when spread out, bluntly obtuse at the apex; corolla 5 mm long, the basal one half united into a broad tube, inserted about the base of the ovary, the upper portion 5 to 7-segmented; segments linear, 1 mmw ide, glabrous, more or less rounded at the apex, frequently smaller and more pointed, its throat densely hairy, deciduous as a whole; stamens about 15, erect, inserted upon the corolla throat, apparently all fertile; filaments 0 5 mm long, subglabrous, gradually tapering from the base to the apex; anther 2.5 mm long, shallowly cordate at the base, mucronately pointed at the apex, ovoidly oblong, laterally dehiscent, the emptied cell walls widely spreading, basifixed; ovary crown flatly conical, pubescent; style strict, stout, 1 cm long, glabrous, terminated by a rugosely 3-angled stigma. Fruits usually solitary, descending, green, fusiform, 2.5 cm long and 1 cm thick, glabrous, subtended by the chartaceous enlarged and persistent calyx.

Type specimen numbers 14058 with flower and 13890 with fruit, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September and October, 1912.

The flowering specimens were collected on the windy wooded ridge connecting Duros and Cawilanan peaks at 3500 feet altitude; the fruiting material was gathered in wet gravelly or stony ground along a deeply shaded streamlet near the Catangan creek at 3000 feet altitude. The Manobo name for the former is "Malobon" or "Marobon" and of the latter "Silanangsang."

Sideroxylon apoensis Elm. n. sp.

Tree; trunk 10 m high or higher, 0.5 m thick, branched toward the top; the twigs quite numerous, suberect, forming dense masses, at first pulverulent, ultimately glabrate, angular in the dry state; bark smoothish, gray and brown mottled, with a milky sap; wood hard, yellowish white, heavy, burly and yet when cut quite brittle. Leaves thinly chartaceous, the entire margins strongly curved upon the under side, dull ashy green above, otherwise paler in color, alternatingly scattered along the branchlets or twigs, obovate or obovately oblong, rounded at the apex, base obtuse or abruptly cuneate, glabrous above, beneath very finely hairy or canescent, 1 dm long including the stalk, averaging 4 cm wide above the middle, frequently smaller ones are intermixed; midrib raised beneath, when young strigosely hairy, finally glabrate; lateral pairs of nerves 5 to 9, divaricate, subparallel, also pronounced beneath, tips anastomosing, shallowly sunken along the upper side of the blade, reticulations fine and equally evident from both sides; petiole 1.5 cm long, glabrous, subterete toward the base, subcompressed otherwise. Flowers clustered from the leaf axils, not odorous but with a sweet taste; pedicels green, scurfy brown or pulverulent, 7.5 mm long, scattered in all directions; buds globose, 4 mm in diameter, reddish brown puberulent but soon wearing glabrous; calyx of 5 nearly free and imbricate segments, more or less united about the base, roundish or oval, thick, curved upon the ventral side, glabrous, the inner 3 thinner especially the margins, 4 mm across, often wider than long, entire; buds globose; corolla of an equal number, united toward the base, ovately oblong or elliptic, whitish and with hyaline margins, numerously and finely veined, 3.5 mm long, 1 mm less in width, subequal, also glabrous, becoming detached as a whole; stamens 5, opposite the petals and inserted upon the basal portion; filaments erect, 1 mm long, expanded toward the base; anther a trifle longer, triangularly ovate, emarginate and basifixed at the base, dehiscing along the edges, the cells widely parted after shedding the pollen; ovary conically elongated, glabrous, 2 mm long, terminated by a 5-pointed stigmatic plate.

Type specimen number 10800, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, May, 1909.

Discovered on a steep wooded slope of mount Calelan at 4500 feet altitude. The native or Bagobo name is "Baloloy."

Apparently nearest related to my number 6071 collected in March, 1904, at Baguio.

Sideroxylon urdanetense Elm. n. sp.

Lofty tree; trunk 12 dm through, terete, nearly straight, 20 or more m high, mainly branched toward the top; bark dark brown and scaling on the surface, testaceus otherwise; sapwood white and burly, hard, odorless and tasteless; main branches spreading, crooked, ultimately numerously rebranched; the rigid twigs erect, much roughened with raised leaf scars, the apical leaf bearing portion dark fulvus pubescent. Leaves clustered toward the apex of the branchlets, in whorls or subalternating, also ascending, quite rigid, shallowly folded upon the upper more or less shining dark green surface, much lighter green beneath, glabrous except the midrib beneath, curing brown on both sides, the entire edges subinvolute when dry, coarsely wavy to ward the apex which terminates in a very short blunt point, obtuse or broadly cuneate toward the base, the smallest oblanceolate, the larger or normal ones oblanceolately oblong, 9 cm long without the petiole and one third as wide across the upper one half; midrib prominently raised beneath and in the fresh state yellowish brown, deeply furrowed above and light yellowish green, brown when dry, short canescent along the lower side; lateral nerves 9 to 11 on each side, very oblique, straight except the ascendingly curved tips, relatively conspicuous beneath, cross bars none or very obscure; petiole 2.5 cm long, furrowed along the upper side, grayish puberulent beneath, thickened toward the base, usually with small buds in their axils. Flowers not seen. Fruits solitary or in pairs from the leaf axils; pedicels divergent, fulvus pubescent, as long as the petioles, gradually thickened toward the distal end; nuts dark vinosus when fully mature, subtended by a whorl of imbricated 5-segmented persistent calyx, obovoidly ellipsoid, 1.5 to 2 cm long, glabrous and shining, mucronately pointed at the broadly rounded apex; calyx segments fulvus on the outside, rigid, almost 5 mm long, ovately rotund.

Type specimen number 14161, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, October, 1912.

Discovered in humid forests about lake Danao at 5000 feet altitude and in wet somewhat stony ground. "Bobonau" is the Manobo name.

Sideroxylon angustifolium Merr. but our leaves have fewer nerves and the smaller fruits are upon longer pedicels.

SAXIFRAGACEAE

Dedea cinerea Elm. n. sp.

Small and rather slender trees; stem subterete, 8 m high, 2 dm thick, terete or subterete, branched from above the middle or toward the tip; wood odorless and tasteless, moderately hard or soft, sappy white, becoming reddish tinged upon exposure; bark thick, grayish white and lenticelled on the surface, light testaceus otherwise; main branches erect, freely rebranched toward the top, comparatively short; twigs ascending and greenish, grayish white pulverulent or glabrate along the apical portion. Leaves also ascending, quite rigid and subchartaceous or subcoriaceous. the entire edges subinvolute, shallowly folded upon the upper much deeper green surface, curing lighter brown beneath, usually densely clustered toward the end of the branchlets, alternate when scattering, otherwise subopposite or in subwhorls, minutely glandular punctate and grayish brown when old beneath, oblong or obovately so, the average blades 8 cm long by 2.5 cm wide across the middle or a trifle above this, obtusely rounded at the apex, base obtuse or subcuneate; midrib strict and ridged along the under side clear into the apex, deeply caniculate and yellowish gray pulverulent, dull brown when dry; lateral nerves 9 to 13 on each side, divaricate, straight except the ascendingly curved tips, obscure even beneath, reticulations and secondary nerves very obscure; petiole yellowish gray pulverulent, averaging 1.5 cm long, grooved along the upper side. Spikes solitary from the leaf axils, subterect, equalling the foliage, dark reddish brown when dry, greenish when in the fresh state, flower bearing from below the middle, the rachis proper striate or angular; flowers alternatingly scattered and in subwhorls, odorless; pedicel 2.5 mm long, strict, cinereously scurfy or glandular; calyx 1.5 mm long, 1 mm wide across the top, with 4 short roundly pointed teeth-like segments, covered on the outside with a crust of a yellowish white glandular mass; petals of an equal number and alternating with the calyx teeth, inserted upon the calyx rim, membranous, glabrous, becoming reflexed, 2 mm long by 1 mm wide, oblong, base truncate, apex roundly so; stamens erect, persistent, alternating with the petals; filaments coriaceous, very broad, glabrous, erect, 0.75 mm long by 0.66 mm wide, pointed at the apex; anther striangularly ovate, inwardly curved, 1 mm long and equally as wide across the truncate base, glabrous, dark reddish brown in the dry state, rounded at the apex, flattened, opening along the lateral edges, basifixed; ovary crown rugose or ridged, light cinereous, extended into a similarly colored short thick style; stigma rugosely 2-lobed, dark reddish brown, glabrous.

Type specimen numbers 13696 and 13749, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September, 1912.

Collected both numbers in the densely wooded and humid depression between the summit peaks of mount Urdaneta at 6000 feet altitude. According to the Manobos the first number is called "Calipayan" and the latter number "Bitaogan."

Spike and flowers are more glutinous in *Dedea apoense Elm.* and the exerted portion of the ovary with the style are distinctly cinereous in our present material.

Hydrangea cuneatifolia Elm. n. sp.

A lofty tree climber or rather epiphytic on them; stems and branches forming more or less rigid clumps, the free branches hanging, the flowering twigs ascendingly curved. Leaves coriaceous, with recurved obtuse or acute tips, opposite, scattered along the young fulvus stems, margins entire, obovately oblong, cuneate at the base or only occasionally obtusely rounded, glabrous, somewhat paler green beneath, drying brownish, the larger blades 15 cm long, 6 cm wide above the middle; midvein brown and prominent beneath, the 5 to 7 lateral pairs very oblique and arcuate, all smooth except the small glandularly hairy axillary tufts, reticulation fine and more evident from beneath; petiole 2 to 3 cm long, densely covered on the upper flattened surface with short stellate tuftlets of hairs. Peduncle stout, obscurely angular, 3 to 5 cm long or much shorter, short brown scurfy or hairy, perceptibly thickened at the distal end; main branches several, 5 cm long, horizontally spreading, branching from near the base, slightly zigzag from the place of branching, densely fulvus; globose involucre in the bud 3.5 cm in diameter; the subtending bracts 3 or more, smooth and yellowish white on the inner side, densely brown felted on the outside, succulent and falling very early; the outer or terminal flowers sterile and with creamy white petaloid appendages measuring 15 mm long; corolla whitish, delicate, caducous, adnate, falling in tact but ultimately becoming separated into 4 petals from the base, 2 mm long, truncately oblong; calyx smooth, subglobose, 2 mm across, minutely 5-denticulate; stamens 10; filaments free, glabrous, inwardly curved from above the middle, 2.5 mm long; anthers 0.5 mm long, broadly elliptic, basifixed, emarginate at both ends especially at the apex; ovary entirely encased by the calyx, with a rim-like disk; style also glabrous, usually 2 and free, 1.25 mm long, the apical stigmatic crest outwardly bent and mostly puberulent; ovules numerous in each of the 2 compartments; mature fruit not seen.

Type specimen number 10732, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, May, 1909.

In dense forested flats from 3000 to 4000 feet elevation. The Bagobos call it "Takir." The fallen bracts were frequently met under trees but the plant usually inhabits the uppermost limbs of lofty or giant trees and clear out of sight of the traveling botanist.

A very close relative of *Hydrangea glandulosa Elm.* and together they may form a new genus.

Spiraeopsis philippinense Elm. n. sp.

Tree; trunk 5 dm thick, subterete, bent or suberect, 12 m high or higher, chiefly branched toward the top; wood white, soft, light in weight, odorless and quite tasteless; bark thick, minutely checked longitudinally, rather light or yellowish gray on the epidermis, otherwise exactly ferrugineus; main branches widely spreading and froming a flat crown, crookedly rebranched; twigs short and suberect, subglaucous green, blackish when dry, not numerous, yellowish gray pulverulent at the apical young portion. Leaves opposite, horizontally spreading except the young ones, shallowly folded and glabrate upon the upper surface, yellowish green beneath and grayish in the dry state, 1.5 to 2.5 dm long, 7 to 9-imparipinnate, the basal or smaller leaflet 3 to 5 cm from the base; leaflets elliptic or more commonly ovately elliptic, the larger ones 1 dm long by 5.5 cm wide across the middle, the rounded basal portion entire, otherwise obscurely serrate, the edges somewhat curved upon the nether pellucid glandular and glabrate side, apex abruptly acute and recurved, the terminal leaflet cuneate at the base; midrib curing ater, puberulent on both sides, ridged beneath, sunken above; lateral nerves 7 to 9 on each side of the midrib, subdivaricate, ascendingly curved, reticulately branched at their distal ends, also prominent and puberulous beneath and of the same color, cross bars quite plain beneath; petiole and rachis suberect, pulverulent, ater when dry, the lateral extended 1 cm beyond the upper pair of opposite leaflets, lateral petiolules only 1 to 2 mm long or none; stipules sessile, subrotund in shape, the larger ones 2 cm across, persistent, foliaceous, margins strongly curved upon the nether yellowish gray and veiny side, frequently becoming parted from the apex toward the base. Inflorescent panicle ascending from the leaf axils, exceeding them, 2 to 4 dm long including the peduncle which is one third to one fourth the length, 1 to 2 dm wide toward the middle, the branches profusely rebranched from below the middle; stalks ebracteate, yellowish gray puberulent, the peduncle and lower branches when old nearly glabrous and ater brown or black when dry; pedicels 1.5 to 2 mm long, terete, short pubescent, thickened toward the base, without subtending bracts, usually in false clusters; buds 1 mm in diameter, globose; perianth 5-segmented, thickly coriaceous, remaining bowl shaped, the basal one third united; segments valvate, 1.25 mm long, ovately oblong and with acute apices, pubescent below the middle on the exterior, puberulent on the same side toward the apex; stamens 10, inserted upon the basal inner portion of the perianth, much exerted in anthesis; filaments 1.5 mm long, filiform, glabrous; anthers oval, basifixed, with an obscure point at the apex, emarginate at the base and eventually becoming lobed, 0.33 mm across, laterally dehiscent, the empty cells persistent and wing-like, spreading; ovary sessile, of 2 contiguous carpels, ovoid, 0.75 mm long, densely hairy; the 2 glabrous styles very short and recurved, bearing small terminal stigmas; capsules 3 mm long, terete, 1 mm thick, a trifle thicker at the base, yellowish gray pubescent, subtended by the persistent perianth and bearing the equally persistent more or less elongated erect or only slightly curved or twisted styles, dehiscing from the base toward the apex, the inner plane side glabrous and open along the median line, the sides rigidly cartilaginous; seeds several or more in each carpel, flat, dark brown, glabrous, elongated bean shaped, 1 mm long, 0.33 mm wide, with a somewhat oblique and unequal membranous pair of wings which are brown and 0.5 mm long.

Type specimen number 14157, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, October, 1912.

Collected on a rocky forested ravine near the summit ridge a little beyond Cawilanan peak at 5000 feet elevation. "Bognag" in Manobo.

Our leaves are smaller, whiter and more glandular beneath than in *Spiraeopsis celebica* (*Blm.*) *Miq.* Both the inflorescence as well as the infrutescence are covered with lighter colored hairs, while the capsules are slenderer and more tapering above the middle to the pointed apex.

SIMARUBACEAE

Harrisonia citrinaecarpa Elm. n. sp.

Subscandent and sprawling; stem terete, 5 cm thick, branched toward the top; wood soft, with a large pith, slightly reddish tinged; bark gray or dirty brown and scaling in thin plates, quite thick, similarly colored beneath the epidermis, inner side whitish, provided with thickly plaited spines; branches very long, spinescent, drooping, the ultimate ones relatively short and suberect; twigs reddish brown and light gray lenticelled, the young apical portion short pubescent. Leaves alternate, mostly horizontal, 1 to 2 dm long, imparipinnate; petiole only a few cm long, furrowed or grooved along the upper side, short pubescent, the rachis very similar; leaflets 5 to 13, membranous, their sides inequilateral except the terminal one, the obtuse to acute or even acuminate apex recurved, the basal leaflets usually smaller and ovately elliptic, the upper ones ovately oblong, sessile or subsessile, entire around the rounded or truncately rounded base, otherwise usually crenate or subentire, the average 4 cm long by nearly one half as wide diagonally across the middle, glabrous and somewhat shining on the upper surface, nerves and reticulations beneath sparsely pubescent or puberulent; midrib bold and soft hairy beneath, puberulent in its small channel upon the opposite side; lateral nerves 5 to 8 on each side, divaricate from and relatively prominent at the midrib, coarsely reticulated toward their distal ends, otherwise reticulations obsolete. Inflorescence terminal and erect, odorless, only few and short paniculately branched, 1 dm long or shorter or longer, short pubescent; the ascending branches occasionally subtended by solitary leaves or leaf-like bracts, rebranched above the middle, the lower branches of the larger branches subtended by oblanceolate bracts, the ultimate branches subtended by much reduced linear though similarly pubescent bracts; pedicels 5 to 8 mm long, puberulent, subtended by bracteoles, strict; bud truncately ellipsoid; calyx pulverulent, red, small, thick, disk-like, 5-toothed; corolla inserted upon the coriaceous calyx, the 5 or 6 segments nearly free, submembranous, widely spreading or reflexed, unequally in width, oblong, 2 to 4 mm long, at the apex a trifle truncate and puberulent, reddish brown on the outside, greenish on the upper side, yellowish when dry; ovary bright red, short ellipsoid or subglobose, 3 mm across, glabrous, fleshy, vertically rugose below the middle, longitudinally rugose above the middle, surrounded by the contiguous light pink filament bases; style also fleshy and glabrous, terete, 5 mm long, terminated by a slightly enlarged more or less rugose and pulverulent stigma; filament rim 3 mm high; each of the 12 parts flattened and covered with a woolly indument, strongly curved at the base and widest at the top; the free portion of the filament 7 mm long, subterete, white, glabrous, arising 0.5 mm below the tip of the woolly basal segments, pointed at the apex; anthers pale yellow, 1.75 mm long, elliptic, widely lobed at the base, basifixed, laterally dehiscent, obtusely rounded at the apex. Fruits pendant from the green stalks, yellowish green when young, turning citrinus after falling and upon the ground, flatly globose or button shaped, 1.5 to 2 cm across; the 6 stony seeds brown and imbedded in the meat.

Type specimen number 13448, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, August, 1912.

Subscandent and sprawling shrubs among the woods of the sand gravelly banks of the Catangan creek at 1000 feet above the sea. "Dagyangas" is the Manobo name.

Only critically distinguished from *Harrisonia perforata* (*Blco.*) *Merr.* by the larger more numerous and pubescent leaflets and by the 6-seeded larger fruits.

SOLANACEAE

Solanum anisophyllum Elm. n. sp.

An ascending or suberect shrub; stem 1 dm thick, 3 m high, subterete, branched from the middle; wood odorless and tasteless, dingy or yellowish white, moderately soft; bark smooth, yellowish gray, with a green hypodermis; main branches spreading, crooked or curved, not numerously rebranched; twigs short or long and slender, frequently descending and gracefully curved toward the tips, glabrous, greenish, densely covered with yellowish white lenticels or excrescences. Leaves scattered, opposite, copious, the pairs very unequal in size and shape, membranous, mostly horizontal, glabrous, curing deep brown on both sides, paler green beneath when fresh, sublucid above, entire;

the larger blades averaging 6 cm wide across the middle and 15 cm long, oblong, the sharply acuminate apex recurved and a trifle falcate, inequilateral toward the obtuse base; smaller blades ovately rotund, averaging 6 cm long by 4 cm wide a trifle below the middle, bluntly apiculate at the apex, broadly rounded at the base; petiole of the larger leaves 1.25 cm long, only 3 mm long in the smaller ones, glabrous or when young hairy beneath, blackish brown when dry, prominently grooved along the upper side; midnerve green, yellowish brown in the dry state and quite prominent beneath, caniculate on the upper side toward the base, when young slightly hairy; lateral nerves 8 on each side of the larger leaves, subdivaricate and ascendingly curved, the tips of the upper ones interarching, the smaller blades with only one half as many nerves, the few cross bars and coarse reticulations evident from beneath only. Flowers odorless, 1 to 3-clustered from the leaf axils, each cluster usually provided on each side with a linear leathery caducous light tawny pubescent stipular bract 5 mm in length; pedicel slender, at least 1.5 cm long, glabrate or cinnamon brown puberulent, gradually thickened toward the calyx and merging into it; calyx turbinate, 3.5 mm long and as wide across the truncate apex, angular by the keeled midrib of the 4 quarters, these keels extending from above the middle of the calyx into an ascendingly curved hook-like tooth 1 mm in length, glabrate or pulverulent; corolla in the bud state elongated, glabrous, narrowed toward the face; segments 4, valvate in the early state, narrowly oblong, 2 mm wide across the middle, 8 mm long, the basal one third united, coriaceous, apex obtuse and narrowly appendaged on the inner side; stamens 4, alternating with the corolla segments and inserted upon their bases; filaments less than 1 mm long, glabrous, broad and fleshy; anthers erect, somewhat flattened or angular, 4 mm long, basifixed, 1.25 mm wide, at the base gradually extended into the filament or narrowly lobed, the truncate apex sterile and of more membranous folds, dehiscing along the inner sides; ovary small, well inserted at the base of the calyx, glabrate, stigma apparently sessile.

Type specimen number 13887, *A. D. E. Elmer*, Cabad-

baran (Mt. Urdaneta), Province of Agusan, Mindanao, September, 1912.

Discovered in wet gravelly earth among bowlders along a deeply shaded streamlet near the Catangan creek at about 3000 feet altitude. According to the Manobo "Cahodon" is the vernacular name.

Manifestly nearest related to *Solanum lagunense Elm.* yet distinguished from it in being more glabrous, inflorescence not cymose and by the distinctly anisophyllous leaves.

Solanum mindanaense Elm. n. sp.

Perennial; stem 1 m long, nearly erect, only sparingly rebranched, dark green, subterete, crooked, densely pulverulent especially toward the top. Leaves in unequal pairs from the same side, widely scattered, horizontally spreading, gradually tapering toward the recurved acuminate apex, toward the base rather abruptly cuneate or attenuate, membranous or subcoriaceous, lighter green below even so in the dry state, soft puberulent on both sides, exceedingly variable in size, entire, the smaller ones broadly lanceolate, the larger ones ovately elongated, the average 14 cm long by 5.5 cm wide a trifle below the middle; petiole varying from 5 to 15 mm long, puberulent, somewhat flattened and strigose along the upper side; midrib rather broad beneath especially toward the base, very little grooved on the upper side at the same end, curing yellowish brown and puberulent; lateral nerves of the normal leaves 4 to 6 on each side, much ascending and curved, quite evident from both sides, cross bars relatively faint. Flowers axillary, usually 3-clustered, subtended by a 5 to 7 mm long linear coriaceous sulphureus pubescent caducous recurved bract; pedicel 8 mm long, glabrate or puberulent, subcoriaceous, gradually extended into the calyx; calyx turbinate, 4 to 5 mm long excluding the spur-like segments, puberulent or subglabrous, frequently glandular dotted, at the truncate apex with 5 radially spreading points which are the extension of the midvein; segments also puberulent, terete or subterete, 0.5 mm long, green as is the united calyx portion, persistent; corolla 8 mm long, the basal one third glabrous and broadly united into a tube; segments 5, alternating with the calyx extensions, ovately oblong, submembranous, the blunt acutely pointed apex usually recurved and somewhat twisted, densely puberulent along the thickened edges, otherwise glabrate, more or less light glandular on the outside, divaricately spreading; stamens 5, erect, alternating with the corolla segments and inserted upon the throat; filaments glabrous, 1 mm long, flattened, erect; anthers 3.5 mm long, 1.5 mm wide, oblong, basifixed, broadly notched at the base, with a pair of apical pores on the inner side a trifle below the obtuse apex, erect and contiguous; ovary conical, 2.5 mm long, 1.75 mm thick, smooth and glabrous; neck 4.5 mm long, also glabrous, terete, 0.5 mm thick; stigma capitate, slightly enlarged.

Type specimen number 13828, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September, 1912.

Gathered from nearly decayed large timbers lying upon wet earth of an open gulch in dense forests about lake Danao at 5000 feet elevation.

Solanum crassipetalum Wall. but our specimen seem to differ from the descriptions in a number of minor characters. Number 13881 from this same general region was also distributed under this new name yet I really believe it to be a distinct species. To be compared with *Solanum biflorum Lour.* and *Solanum denticulatum Blm.*

THEACEAE

Adinandra apoense Elm. n. sp.

A rather large tree; trunk 6 dm thick, 15 m high; branches chiefly above the middle, forming an elongated crown, the glabrous twigs relatively short and numerous; wood whitish or turning brownish toward the center, moderately soft; bark brown, gray on the branchlets. Leaves rigidly coriaceous, elliptically oblong or ovately so, glabrous, shining green above, much paler green beneath, curing unequally dull brown on its 2 sides, alternate, copious, the edges slightly recurved at least in the dry state, entire toward the obtusely cuneate base, otherwise obscurely and crenately serrate, apex broadly rounded and occasionally emarginate, at least 5 cm long, one half as wide across the middle or a trifle above it; midrib black, glabrous, prominently raised beneath, well sunken along the upper side; nerves divaricate, about 7 to 9 pairs, relatively faint beneath, their tips reticulately united, frequently with secondary ones intermixed, reticulations few and obscure; petiole 5 mm long, glabrous at least when old, nearly black in the dry state, shallowly grooved above; bud bract minute, puerulent. Flowers pendulous, upon recurved green and rigid 1 to 1.5 cm long pedicels, odorless; calyx erect, thick, glabrous, imbricate, nearly free and 1 cm long, the 5 lobes short ovate, margins thin, the inner surface smooth and blistery, roughened on the outer exposed sides; petals of the same number, 1.5 cm long, imbricate and the basal portion united, 7.5 mm wide, truncately oblong, appearing glandular on the smooth inner surface, olivaceus on the middle upper or exposed portion, glabrous otherwise, irregularly rounded at the apex, veiny; stamens numerous, very unequal in length, inserted upon the petals 2 mm from the base; filaments 6 mm long or the inner ones less in length, ciliate pubescent; anthers 3.5 mm long, lanceolate, a trifle compressed, the connective densely hairy along the back and only sparsely so on the inner side; ovary glabrous, one half imbedded; style 1.5 cm long, glabrous, thick, terete, terminated into a small apical stigma.

Type specimen number 11265, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, August, 1909.

Discovered in rich moist humus covered soil of dense forests at 3750 feet altitude along the Burebid range. It is not surprising that the Bagobos call it "Malagsam" a name applied to a number of species of *Eugenia*.

Adinandra merrillii Elm. n. sp.

Rather large trees; trunk 1 m thick, 18 m high, branched from the middle or above it, terete except toward the base; wood moderately soft, white or whitish, quite without odor or any taste; bark gray and smoothish, otherwise brown except the inner sappy white portion; main branches finally numerously rebranched, spreading and crooked; twigs suberect, relatively short, quite rigid and tough, numerous, the greenish glabrate tips turning blackish when dry. Leaves ascending, rigidly coriaceous, copious, alternate, almost flat, pleasing shining green above, very much paler or yellowish green beneath, the entire edges a trifle involute when dry at least, curing unequally brown on the 2 sides, rounded at the apex, base obtuse or widely cuneate, the larger ones 6 cm long and one half as wide, the smallest leaves one half as large, obovately elliptic, more or less punctate on both sides; midrid prominent and dark brown when dry beneath, deeply grooved the full length along the upper side; petiole 5 mm long or longer, drying nearly black, glabrous, caniculate along the upper flattened surface; lateral nerves comparatively faint, 5 to 7 and with a few additional secondary nerves intervening, straight, ascending, forked toward their distal ends, evident from both sides, reticulations numerous. Flowers upon green and glabrous more or less recurved 1.5 to 2 cm long pedicels which arise either from the leaf axils or opposite them; calyx subtended by a pair of broad thick glabrous 3 to 4 mm long bracts; sepals united toward the base, glabrous, thick, imbricated into a cup, nearly 1 cm long, the outer 2 enclosing the inner 2, ovately rotund, margins relatively thin and numerously punctate; petals about 5, veiny, elliptic, 1 to 1.5 cm long, thinner in texture, the basal 2 mm united into a broad tube, glabrous except the throat; stamens more or less grouped and inserted opposite the inner petals upon the tube, about 3, apparently all fertile though somewhat unequal in length and size; free portion of filaments varying from 1 to 3 mm in length, densely yellowish brown hairy especially at their ends, fleshy, subcompressed, becoming thicker or wider toward the distal end; anthers 3 mm long, auriculate at the base, broadly lanceolate, gradually tapering to the acute point, basifixed, pubescent along the back, cells apparently unequal and ventrally dehiscent; ovary flatly globose, 3 mm in diameter, very lightly woolly; style at least 1 mm thick by 6 mm long, glabrous or as the ovary very lightly woolly; stigma terminal, small.

Type specimen number 14088, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, October, 1912.

Gathered in the humid lake Danao forested basin at 4750 feet altitude. The native or Manobo name is "Sangnanan." Dedicated to *E. D. Merrill*, botanist in the Bureau of Science and associate professor of botany in the University of the Philippines.

To be classified nearest to *Adinandra loheri Merr.*

Adinandra robinsonii Elm. n. sp.

A middle sized tree; stem 10 m high, 2.5 dm thick, branched from below the middle and forming an elongated crown; branches comparatively short, divaricate, laxly rebranched, the ascending twigs dull olivaceus strigose; wood whitish, soft and without odor or taste; bark brown, smoothish. Leaves copious, subchartaceous, alternatingly scattered along the twigs, slightly ascending, the acuminate tips recurved, base acute or obtuse, narrowly oblong or oblanceolately oblong, entire toward the base, otherwise with fine crenate teeth, edges subinvolute in the dry state at least, 7.5 cm long and 2 cm wide or smaller, drying grayish green, beneath strigosely pubescent in the younger state; midrib prominent and strigose beneath, smooth and very shallowly grooved along the upper side; the lateral nerves oblique, strict, very obscure, reticulations obsolete or nearly so; petiole 3 mm long, strigose, channeled along the upper side; bud bract densely olivaceus strigose. Flowers upon pendulously recurved pedicels, either solitary or in pairs from the leaf axils; pedicel slender, 2.5 cm long, sparsely yellowish strigose, slightly enlarged toward the distal end, greenish, terete; calyx thick, closely imbricate, the 5 lobes united at the very base, the outer exposed portion hairy, glabrous on the deeply concave side, shortly ciliate and minutely apiculate, ovate, the outer basal ones shorter, the inner ones gradually becoming petaloid, veiny; petals also imbricate, 1 cm long erect, olivaceus hairy on the outer exposed side, otherwise glabrous, 5 mm wide, also veiny, truncately obtuse at the apex; stamens erect, in a rim and inserted upon the petals 1 mm from the base; filaments 2 mm long, also glabrous, obscurely compressed: anthers narrowly oblong, as long, somewhat compressed, the connective especially hairy along the outer side and produced into a prominent 1.25 mm long point; ovary sparsely hairy, globosely ellipsoid, 3 mm in diameter; style thick, terete, 7.5 mm long, strict, bearing a small flattened stigma.

Type specimen number 11461, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, August, 1909.

Collected in a densely moss laden humid forested flat at 6750 feet of mount Apo. My Bagobo companion called it "Marintok."

Very near to number 1369 *Williams* the type of *Adinandra elliptica C. B. Rob.* Named after the late *Dr. C. B. Robinson* who lost his life in Amboina.

Adinandra urdanetense Elm. n. sp.

Lofty tree; trunk 12 dm through, 20 m high or higher, its main branches arising from above the middle, terete, wadded toward the base, somewhat crooked; twigs erect or ascending, relatively short, the green apical portion dull brown when dry, glabrous. Leaves alternate, similarly spreading, rigidly coriaceous, also glabrous, deeper brown on the upper side when dry, entire, flat or shallowly conduplicate on the upper deeper green side, somewhat recurved, obtuse or obtusely rounded at the apex, base cuneate, obovate or obovately elliptic, the larger blades averaging 6 cm long by one half as wide above the middle; petiole 1.25 to 2.25 cm long, caniculate, glabrous, blackish brown in the dry state, easily separating upon drying, the leaf sides a trifle decurrent at the upper end; midrib prominent, grooved along the upper side, similar beneath in the dry leaves; lateral nerves 5 to 7 on each side, ascending, very obscure, cross bars and reticulations obsolete. Flowers not seen. Fruits suberect, lateral but usually just above the leaf axils, solitary or in irregular whorls, subglobose or ovoidly globose, whitish or very pale yellowish green, smooth, glabrous, 1.25 cm thick, dark brown when dry, terminal, 2-celled, about 12 seeds in each cell; seeds achene-like, 4 mm long, whitish on their outer sides, reddish on their angled inner surfaces; calyx persistent, glabrous, rigid and thick, about 7-segmented much smaller and pointed, the inner or larger ones rounded.

Type specimen number 14078, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, October, 1912.

Collected along the heavily forested ridge trail just beyond the summit of Cawilanan peak at 5000 feet elevation. This also the Manobos call "Sangnanan."

Differentiated from *Adinandra montana Merr.* by its shorter branchlets, much shorter bud bracts, leaves more rounded at the apex, fruits more nearly globose, outer calyx segments or bracts persistent, the inner segments hyaline margined not ciliate.

Thea reticulata Elm. n. sp.

Small and slender tree; stem terete or wadded at the base; 2 dm thick, 12 m high; wood soft, yellowish tinged especially the heartwood, odorless, bitterish, light in specific gravity; bark thick, latericius except the greenish gray and brown mottled smooth surface; main limbs from the middle, divaricate, slender, rebranched, the apical young portion grayish green or yellowish pubescent. Leaves alternating, chartaceous, deep green above, much paler beneath, flat, horizontal or the terminal ones descending, greenish when dry, obovately oblong, entire, the edges brown bordered, much wavy or rugose, obtuse at the base, truncately rounded the at top and terminated by an abrupt sharply pointed 5 to 8 mm long recurved apex, the larger ones 2 dm long by 8 cm wide above the middle; midrib much raised beneath, sparsely strigose along the dull reddish brown nether side, well caniculate and glabrous along the upper lighter green surface; petioles 1 to 1.5 cm long, very thick, ater when dry, flattened along the upper glabrous side, otherwise strigose but ultimately glabrate; lateral nerves numerously interlaced with the conspicuous reticulations especially prominent from beneath. Flowers upon 3 to 8 cm long stalks, the shorter occasionally unbranched, the longer only sparingly rebranched, stout, when young densely yellowish gray strigose, more or less roughened; flower pedicels averaging 2.5 cm long, usually recurved, densely tomentose; flower star shaped, rigid, subpendulous, odorless; bud globose, 1 cm in diameter; calyx valvate, separating from the apex, 1.25 cm long, the basal one third rather broad and united; the 5 segments unequal in width, triangularly elongated, acute at the apex, very thick and rigid, entire margins slightly folded upon the ventral surface, tomentose on the outside, the inner side densely covered with long yellowish hairs, persistent, rotately spreading; petals filamentous, about 40, glabrous, basal portion united in a fleshy rim and inserted around the base of the ovary, immediately surrounding the stamens, in the early state curved inwardly, the distal one half or more ultimately becoming separated and tapering to a slender point, averaging 5 mm long, blackish brown in the dry state; stamens numerous, erect, inserted upon a densely ciliate torus; hairs 2 mm long, yellowish; filaments filiform, 3.5 mm long or longer, glabrous, flesh color, the outer ones shorter at least in the early stages, attached to the anther from the distal end; anther in the young state folded down along the filament, ultimately spreading, each one half 2 mm long, subcompressed, fluted on the outer side, becoming divided from the base toward the distal end, glabrous, 0.75 mm wide, ends truncate; ovary conically rounded, brown hairy; style slender, 1 to 1.5 cm long, pubescent except the upper portion; stigma short clavate or subcapitate. Fruit pedicel 2 cm long, 5 mm thick, terete, glabrate, dark green, more or less lenticelled, 1.25 cm across the torus; fruit irregularly globose, pendulous, of all sizes, green but yellowish brown scale covered and roughened, the larger ones 6 cm in diameter; carpels thick, dehiscing from the apex toward the base in 5 parts.

Type specimen number 13478, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, August, 1912.

Discovered upon a steep and densely forested slope along the southwestern side of Duros peak or along the trail toward the summit of that peak at 3000 feet altitude. "Magsudod" in Manobo.

Judging by the fruits alone the author had no doubt of it belonging to the genus *Thea* though the flowers are very curious. It may prove to be a new genus or belong to some other family.

THYMELEACEAE

Phaleria axillaris Elm. n. sp.

A low and spreading undershrub; stem terete but crooked, quite rigid, tough, 1.25 cm thick, about 1 m high, oppositely branched toward the top; wood whitish, with a whiter colored pith, tasteless, vile in odor; bark smooth, yellowish gray on the surface, greenish otherwise; branches horizontal, unbranched. Leaves similarly spreading, thinly coriaceous, membranous, much lighter green beneath; only the abruptly acute tips recurved, curing nearly equally brown on both sides, entire, obtusely rounded or subcuneate at the base, glabrous, oblong, oppositely scattered along the greenish branches, the average blades 1.5 dm long by 6 cm wide across the middle or above it; midvein rather prominent beneath, narrowly grooved above, darker brown in the dry state; lateral nerves 7 to 9 on each side, ascending and little curved, tips of the upper ones at least faintly interarching, reticulations barely visible under a lens; petiole 1 cm long or less, flattened and shallowly grooved above, glabrate, dark brown when dry; interpetiole also glabrate when old, 5 mm long, broad at the base, extended into a sharply acuminate point. Infrutescence in axillary clusters; stalks 5 to 15 mm long, the longer ones usually branched, all arising from a short and thick common stalk, ultimately glabrate, the branches subtended by persistent bracts, the slender fruit bearing pedicel bibracteate at about the middle and usually ascendingly curved; pseudostalk 3 mm long or twice as long, one half as wide, compressed, rigid, puberulent, terminated at the distal end by a pair of short very thick and acute bracts; pedicel 1.5 mm long or longer, subterete and thinner though becoming somewhat enlarged in the fruiting state; fruit glabrous, obscurely and angularly ovoid, terminated by 4 persistent minute calyx or perianth segments, 1.25 cm long, 1 cm wide below the middle, yellowish when mature though eventually turning red, berry-like, 4-celled, apparently 4-seeded.

Type specimen number 13883, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September, 1912.

Only one plant of this little upright undershrub was found in a humus covered rather dry soil of deep woods along a ravine of the Catagan creek at 3000 feet altitude. "Dahingyoyon" in Manobo.

Resembling *Phaleria cumingii Vil.* yet it may prove to be a species of *Rubiaceae*.

TILIACEAE

Grewia pyriformis Elm. n. sp.

Small or medium sized tree; trunk 3 dm thick, subterete and suberect, 8 m high, branched from the middle; wood soft, maple white, odorless and without taste; bark smooth and mottled, brownish white otherwise; main branches rather long and widely spreading, freely rebranched; twigs lax and subpendant, glabrous, the ultimate green portion turning dull brown upon drying, terete. Leaves copious, alternatingly spreading along the branchlets, glabrous, when dry brown on both sides, chartaceous, horizontal or descending, curvingly folded upon the upper darker green surface, entire or obscurely dentate to crenate toward the sharply pointed acuminate apex, base broadly rounded, the average lamina 13 cm long by 5 cm wide across the middle or below it, narrowly elliptic to ovately elliptic or oblongish; petiole 1.5 cm long or the lower old ones 2 cm in length, smooth, terete, thickened toward the distal end, green but dark reddish brown when dry, persistent; veins 3, arising from the base, pale or yellowish green when fresh, brown when dry, quite prominent beneath, plane above, the middle one extending straight into the apex, the lateral pair terminating above the middle, hairy pockets in their axils at the base, the midvein with 2 to 3 ascending lateral pairs of nerves from the middle, cross bars and reticulations very faint. Flowers not found. Infrutescence axillary but chiefly from the terminal leaves, 3 to 7 cm long; stalks usually solitary, very sparingly rebranched, yellowish green, more or less zigzag when unbranched, minutely yellowish gray stellate in the early state, ultimately glabrate; fruit pyriform, at least 3 cm long, nearly 2 cm thick above the middle, smooth and hard, shining, flesh red when fully ripe, alternatingly arranged or only solitary at the base, similar in color and vestiture to the stalks which bear them.

Type specimen number 13996, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, October, 1912.

Discovered in wet sticky soil along wooded banks of streams among the hemp fields at 500 feet above ocean level. The Manobos call it "Carong."

Leaves like those of *Grewia stylocarpa Warb.* but with different fruits.

ULMACEAE

Celtis mindanaensis Elm. n. sp.

An erect tree; trunk 8 m high, 1.5 dm thick, terete, straight, branched above the middle; wood pale or dirty yellowish white, hard, odorless and tasteless; bark smooth, mottled; branches crookedly rebranched, forming a rather dense elongated crown; twigs rigid, also crooked, rather slender, glabrous. Leaves alternatingly and widely scattering along the branchlets, rigidly chartaceous, descending or subrecurved, nearly flat or concave on the lighter green lower surface, curing nearly equally brown on both sides, entire, subelliptic to ovately oblong, gradually tapering to the sharply acute to acuminate apex, base very broadly obtuse or rounded and occasionally slightly inequilateral, the normal ones 17 cm long, 7 cm wide across the middle or just below it, glabrous, 3-veined from the base; veins prominent beneath, slightly sunken on the upper surface, the midrib with inconspicuous secondary nerves, the lateral 2 veins with secondary ones on the outer side only and whose tips are usually united to form a submarginal line 3 mm from the edge, reticulations few and obscure; petiole smooth and glabrous, 1 cm long, quite broad and caniculate along the upper side; buds elongated, pointed, yellowish gray, sparsely strigose. Flowers not seen. Infrutescence terminal or from the uppermost leaf axils; stalks 1 to 4 cm long, glabrous, bright green, if branched very shortly so; fruits usually few clustered toward the ends, upon 3 to 5 mm long pedicels, yellowish green, ultimately flesh red, barely 1.5 cm long, obovoidly globose especially after being dried, quite pointed toward the base, the circular stigma more or less raised.

Type specimen number 10999, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, June, 1909.

Gathered in dry somewhat stony soil of woods skirting the ridge of the Baracatan creek ravine and fronting the upper cogon limits at 1500 feet altitude. "Isog" is the Bagobo vernacular name.

It has a different infrutescence and its leaves are more elongated than in *Celtis philippinensis Blco.*

URTICACEAE

Debregeasia luteocarpa Elm. n. sp.

Ascending shrub; stem 1 dm thick, subterete, 5 m high, branched from below the middle; wood wet and very soft, without odor or taste, sappy white throughout; bark dark or dull brown, tough, with lenticels or excrescences, otherwise also sappy white; main branches ascending and spreading, freely rebranched or few branched only, the ultimate ones slender and lax, soft hoary tomentose, the lateral twigs relatively short. Leaves numerous, alternatingly clustered especially toward the ends of the branchlets, horizontally spreading, the gradually acuminate apex recurved, light green and sparsely strigose above, dull brown when dry and more or less roughened by the raised interstices of the lamina, grayish white beneath even in the dry state, cinereously pubescent, interstices more or less sunken beneath, exceedingly variable in size, more or less lance shaped or the largest ones elongated to lanceolate, base obtusely rounded and subentire, otherwise with numerous dentately serrate teeth, the average blades 1 dm long by 3 cm wide in the middle region, frequently much smaller, becoming easily detached while drying; midrib hirsute beneath, strigose above; lateral nerves 5 to 7 pairs, the basal pair arising from the base, much ascending, the upper pairs short and more numerous, tips anastomosing, cross bars and cross reticulations very numerous and prominent beneath; petiole 5 to 15 mm long, more yellowish hirsute; bud bracts very caducous, 5 mm long, brown, membranous, deeply concave and almost glabrate on the ventral side, oblongish, terminated by 2 slender teeth. Inflorescence from the upper leaf axils, the fruits laterally clustered below the foliage, 1 cm long, the fruits twice as long in the fruiting state; peduncle solitary or few clustered, gray hirsute, subtended by caducous bracts, bifurcate; main branches shorter, similarly branched, subtended by deciduous rather sharply pointed bracts, ultimate branchlets very short; involucral bracts 1 mm long, oblong, sparsely ciliate, membranous, brown, acute to obtuse at the apex, the inner bracts or bracteoles much smaller; pistils many, minute, pedicel-like, surrounded by twice as long linear more or less hairy perianth segments, subsessile; buds of staminate flowers ovoid or subglobose; perianth less than 1 mm long, 4-segmented, blackish in the dry state, strigulose on the dorsal convex side, oblong, acute at the apex, coriaceous; stamens 4, opposite the segments; filaments 0.3 mm long, smooth, dark brown, compressed, inserted upon the basal portion of the perianth segments; anther subrotund or broadest across the top, 0.3 to 0.5 mm across, light yellow even in the dry state, dorsifixed, laterally dehiscent. Fruiting heads subglobose, less than 5 mm in diameter, sour juicy and berry-like, luteus to aurantiacus in color; mature carpels less than 1 mm long, short clavate, irregular in shape or suboblique, usually upon a short but distinct stout pedicel, stigmatic portion relatively large and quite evident, easily becoming detached from the persistent perianth segments.

Type specimen number 14068, *A. D. E. Elmer*, Cabad-

baran (Mt. Urdaneta), Province of Agusan, Mindanao, October, 1912.

Discovered in black soggy alluvial soil among jungles at the lower end of lake Danao at 4750 feet altitude. "Damay" is the Manobo name.

The luteus to aurantiacus fruits at once distinguish it from the red to crimson fruited *Debregeasia angustifolium C. B. Rob.* an alpine northern Luzon plant. Only one shrub was seen.

Elatostema agusanense Elm. n. sp.

Rather coarse or large tufts; stems several, ascending or the outer ones reclining at the base, varying from 1 to 4 dm long or high, usually curved, curing dull green and striate or longitudinally grooved, slender when compared with their lengths. Leaves chiefly above the middle of the stems which are unbranched, alternate, curing very unequally greenish brown on the 2 sides, much darker green on the upper glabrous side, cystoliths minute, duller or appearing imbedded on the lower surface, glabrous except the nerves beneath, rather abruptly terminated into the acute to acuminately recurved apex, slenderly or more commonly broadly cuneate toward the obliquely acute or usually obtuse base, the scattering basal leaves much reduced, the basal one third entire, inequilateral, otherwise serrately dentate, the lower edge of the broader side much curved, elongated though the widest portion is usually a trifle above the middle, the smallest ones broadly oblanceolate in outline or the shorter obovate in general outline; the average normal leaves 12 cm long by one third as wide just above the middle but frequently smaller especially those on the smaller stems; midrib pronounced beneath and yellowish gray tomentulose, slightly and gradually curved, caniculate along the upper side at the base; lateral nerves 5 to 7, usually the broader side with 1 or 2 more than the upper or narrower side, the basal pair not arising from the same place though both running subparallel with the margins and extending to the middle of the leaf, upper nerves ascendingly curved, their tips coarsely reticulated and united, reticulations along the midrib relatively scarce; the lower side of the leaf base subauriculate and with 1 to 3 very short extra nerves, all similar in color and vestiture to the comparatively bold midrib; petiole very short yet distinct; stipule deciduous, 1 cm long, 3 cm wide at the base or a little wider, setaceously pointed, pseudostrigose on both sides, dull greenish in the dry state. Flowers in axillary clusters, the 2 sexes upon different plants or at least upon different stems of the same cluster; the staminate clusters larger, whiter and less ciliately hairy than the pistillate clusters; inflorescence in quadrangular clusters, subsessile, diverse in size, the largest ones nearly 2 cm wide across the widest portion, obscurely bilobed; involucre very thick and coriaceous, greenish, glabrous, the segments more or less united into a disk-like receptacle whose margins curve upward and enclose the flowers, slightly roughened on the exterior; flowers grouped in 4's, surrounded by a 6 segmented involucel; bracts averaging 3 mm long, hyaline except the midrib and the apical margin which are greenish colored, about 2 mm wide, a trifle wider across the truncate apex, edges finely ciliate; florets about 6 or only 4 in a group, surrounded by a whorl of 3 segments; bracteoles 2 to 3 mm long, unequal in width, transparent except the greenish midrib which is densely ciliate along the keel toward the obtuse to acute apex; pedicels also transparent, ribbon-like 2 mm long or longer, very short in the bud state; perianth segments 4, united toward the base, 1.5 mm long, ovately elliptic, with acute slightly green colored apices; glabrous filament also short in the young state, slenderly elongated when mature; anther less than 1 mm long, basifixed, apical portion bilobed, inflexed while in bud, sprung back in anthesis. Perianth of the seeded heads greenish, densely ciliate; seeds minute, bony, brown, elongated, very minutely pitted.

Type specimen number 14250, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, August, 1912.

Gathered in very wet ground of a small open place along a streamlet in a heavy forested ravine at 1500 feet altitude.

Associated and mixed with number 13492 or *Elatostema longifolium Wedd.* Our broader leaves and longer bracts are distinguishing characters from 456 *Cuming*, a cotype sheet of which is in the Bureau of Science herbarium.

Some of these very closely allied species of *Elatostema* seem to be gregarious for some reason or another. *Elatostema agusanense Elm.* and *Elatostema longifolium Wedd.* were collected under one number in the field, though the dry material could easily be separated into two groups. A similar association is found between *Elatostema umbrinus Elm.* and *Elatostema urdanetense Elm.*

Elatostema antonii Elm. n. sp.

Heavily succulent and few stemmed tufts; stems usually 3 or more from the same root cluster, reclining at the base and spreading, usually sloping downward, subterete, 2.5 cm thick when fresh at the base, soft herbaceous and green, 1 m long or shorter, glabrate, curing yellowish green along the terminal or leaf bearing portion, the internodes deeply channeled along the upper side of the prostrate or inclining stems clear to the leaf bearing tips, the lower side toward the base bearing roots, very seldom rebranched. Leaves alternate, usually several toward the distal end, in 2 lateral rows, flat, chiefly descending, much paler green on the soft pubescent or lanose nether side, glabrous above and distinctly covered with numerous chalky white cystoliths, drying unequally green on the sides, 2 dm long by 7.5 cm wide above the middle, terminated in a linear sharply pointed 1 cm long apex, a trifle inequilateral, basal portion broadly cuneate, subentire toward the base, otherwise serrately toothed, upper edge nearly straight, lower side of the lamina broadest, obovately oblong in general outline; petiole 1.5 to 2 cm long, dirty hirsute along the lower side, broadly caniculate along the upper; midrib nearly straight, green and soft yellowish green hirsute beneath; lateral nerves 7 to 9 on each side, much ascending and usually curved, those along the lower side mainly forked toward their distal ends, cross reticulation obscure although more numerous along the toothed margins; stipule or bud bract caducous, linear to lanceolate, very pale green at least when dry, up to 3 cm long, slenderly pointed or blunter, minutely tomentose on the dorsal side. Inflorescence or infrutescence axillary, green, suberect and lying across the upper side of the stem, solitary, the odorless flowers greenish white; peduncle green, fleshy, few mm long, hispidly pubescent; involucre 1 to 1.5 cm wide, composed of 2 alternating pairs of broad lobes, thickly coriaceous, green, slightly hispid on the outside, occasionally more or less united into a fleshy disk; flowers grouped in 4's, staminate, very numerous and dense upon the upper surface of the involucral disk; involucels hyaline, containing several florets; bracteoles 2 mm long, unequal in width, with a relatively conspicuous midrib especially toward the distal ends, several, obcuneate or obovately oblong, 1.5 mm wide across the broadened apical portion, the keel and around the apex ciliate; pedicels nearly as long as the bracts, subhyaline, somewhat compressed, persistent, glabrous, unequal in length; the 4 involucral bracts subtending the 4 stamens 1 mm long, oblong to ovate, smooth and transparent; filaments short, longer when mature, also transparent; anther less than 1 mm long, inflexed, finally in the reverse position, the cells well separated from the base to the apex and subterete, basifixed; pistillate flowers not observed.

Type specimen number 13894, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September, 1912.

Discovered this most characteristic of our Philippine species of *Elatostema* in shallow earth covering huge bowlders strewn along the solidly shaded Catangan creek bed at 3000 feet elevation. Named with pleasure after our son *Anton Dambor Elmer*. The Manobo name is "Calangboaw."

This plant is easily cured and its large underneath leaf surfaces are long hairy. The stems lie over the bowlders in great confusion, their internodes are most characteristically channeled longitudinally along the upper side, each series of internodal channels alternating with the adjoining ones. Some of these channels extend one half way through the stem and are relatively wide. They serve as water reservoirs during the dry desicating days or periods.

Elatostema camiguinense Elm. n. sp.

Dense masses scattered in clumps; stems exceedingly variable in length, from 3 cm to 5 dm high, angular, at the base reclining, only the larger ones branched from the middle, more or less reclining at the base or creeping and profusely rooted, erect or nearly so, pseudostrigose, green when dry; runners arising from the lower leaf axils or from the root portion of the stem, horizontal, 1 dm long or longer or shorter, very slender. Leaves alternate, chiefly above the middle, paler green beneath both in the fresh and dry state, thinly coriaceous, subsessile, the widely scattering lower ones much reduced, the larger lamina 9 cm long by 2 cm wide across the middle or the widest portion, the narrower ones broadly lanceolate, otherwise elongated, inequilateral and subfalcate, similarly tapering toward both ends, cuneate toward the oblique base, apex slenderly acuminate, the basal one third to one half entire, otherwise coarsely and sharply serrately dentate, glabrous, cystoliths obscure beneath, the leaflets on the runner obliquely obovate and about 5 to 8 mm long, occasionally more elongated; midrib gradually curved, similarly green beneath, not conspicuous; the lower or wider side with 3 to 4 nerves, 1 to 2 nerves less in the upper or narrower side, the basal one extending along the edge and about one half the length of the blade, the upper basal nerve extending along the edge to above the middle of the blades; the balance ascendingly curved from the middle or above the middle, usually forked toward their distal ends and terminating into the teeth, other cross bars and reticulations none; stipular bracts linear and setaceously pointed, pale yellowish green, glabrous, 5 mm long or shorter, subpersistent, pistillate flowers in sessile clusters from the upper leaf axils; staminate ones pedicelled and usually from the lower leaf axils or along the basal portion of the stem or even upon the runners; peduncle varying from 5 to 20 mm long, glabrous, pale green; involucre broadly cup shaped, green, usually composed of 2 unequal pairs of alternating bracts; outer and larger pair connate at the base, 5 mm long, elliptic though apex somewhat constricted, green and with 3 parallel veins, margins only transparent, finely ciliate about the stout usually recurved point; the inner pair of bracts much narrower and a trifle shorter, otherwise similar; staminate flowers severally grouped, subtended by an involucel; bracteoles 4 mm long, 2 mm wide above the middle, the middle region 3-veined and green, the margins hyaline, stout apex constricted and ciliate; main pedicel short at first, becoming few mm in length, subtended by a secondary whorl of involucral bracteoles; bracteoles averaging 2 mm long, very unequal in width, hyaline except the pale green midrib toward the apex, usually widest above the middle, ciliate along the edges above the middle especially at the apex, obcuneate to linear; pedicel 1 mm long, transparent; perianth 1.25 mm long, very thin, the 4 segments toward the apex sparsely ciliate; filaments very short in the bud state, ultimately elongated; anthers basifixed, cleft from the apex toward the base, 0.75 mm long; pistillate heads flat, sessile, 5 mm wide or less; involucre united into a disk, green, coriaceous, divided and terminated into constricted rather prominent points, pubescent toward the apex; bracts of involucels 1.5 mm long, hyaline, linear, ciliate toward the apex, the inner bracts shorter and very linear; achene pedicel hyaline, 1 mm long, expanded at the distal end; seed smooth, brown, fusiform, 0.5 mm long.

Type specimen number 14227, *A. D. E. Elmer*, Mambajao, Island of Camiguin, Mindanao, November, 1912.

Densely spreading and matting rock ledges thinly covered with soil along a streamlet of a humid wooded ravine at about 2000 feet above the surrounding sea. The delicate runners with small scattered leaflets is quite a unique character of this species.

To be critically considered and studied in connection with *Elatostema lutescens C. B. Rob.* and *Elatostema viridescens Elm.*

Elatostema pictum Elm. n. sp.

Small clusters or solitary and creeping; stem fleshy, occasionally branched, terete, pale green, varying from a few cm to 2 dm high or rather long, usually curved, quite slender, glabrous, blackish brown when dry, taking roots from the lower leaf joints. Leaves alternatingly scattered from below the middle of the stem or frequently from near the base, diverse in size, horizontal and spreading over the rock surface, also succulent, much paler green beneath, very deep green on the upper side except the relatively pale or yellowish green region along the veins or nerves, curing unequally green on the 2 sides, obovate and falcate or very unequally sided, broadly cuneate or obtusely rounded toward the oblique base, broadly rounded at the apex or terminated by a blunt tooth, upper margin straight and entire except a few blunt teeth toward the apex and terminating at the base a few mm above the lower side, the broader or lower side much curved and usually coarsely dentate from the middle to the apex, sessile, 2 to 4 cm long though occasionally only 1 cm long , 1.75 to 2.5 cm wide a trifle above the middle or at the widest portion, the basal ones usually much reduced, cystoliths beneath scattering and obscure, chalky white and raised on the upper side especially crowded along the edges; veins 3, the stoutest or middle one curved and extending into the apex, the lateral pair of veins arising from near the base, the upper one straight and 2 mm below the edge of the lamina, the lower one curved and interarching with the lateral nerves of the midvein above the middle and along its lower side; reticulations coarse or merely branched, few, dark brown on the lower side and light green on the upper side in the dry state; stipule oblong, subhyaline, glabrous, 1 cm long or less, deciduous. Male flowers pale green and upon similarly colored slender stalks; female flowers in smaller sessile axillary clusters which have a hoary appearance; peduncle 1.5 cm long, glabrous, green and purplish streaked; involucre 7 mm long, the 4 or more segments forming a broad cup; bracts erect, broadly ovate or elliptic, 4 mm wide, hyaline except the midrib and the basal region which is green and purplish spotted, the broad marginal sides clearly transparent except the midrib which is usually purplish marked, very unequal in size, 4 or more, 3 mm long for the average ones to 2 mm wide, oblong, broad at at the apex, free;

pedicels less in length, hyaline; the 4 stamens 1.5 cm long, ovate, with rather acute points, transparent, occasionally bearing a spicule or more toward the apex on the dorsal side; anther 1 mm long, divided from the base to the apex, introrse before and retrorse after anthesis, basifixed; involucre of pistillate flowers flattened, the segments united at the base; outer pair of segments 3 mm long, ovate, long pointed, green at the base, otherwise purplish streaked, pubescent on the back and ciliate along the margins; involucels numerous; bracteoles 1.5 mm long, linear, free, with rounded apices, transparent, conspicuously ciliate; pistil small, exceeded by the bracts of the involucels, short stipitate; ovary glabrous, fusiform in outline, terminated by a small brush of stigmas.

Type specimen number 13484, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, August, 1912.

Matting rock surfaces or creeping along the bottom of cliffs or around the lower border of huge bowlders on the west nearly precipitous summit of Duros peak at 4000 feet elevation. "Yogayod" in the Manobo dialect.

Elatostema gitingense Elm. n. sp.

Small clusters; stems decumbent at the base, terete, succulent, dull brown or greenish toward the top, 8 to 16 cm long or shorter and occasionally longer, usually unbranched, taking root along the lower side or that portion lying upon the ground, the longer ones usually curved, ultimately suberect, the younger portion sordidly appressed strigose. Leaves alternatingly scattered above the middle, subsessile or very shortly petioled, a trifle inequilateral, the upper narrower side nearly straight, terminated at the base 1 mm above the lower side, oblong, the scattering basal ones smaller, minutely serrately dentate toward the obtusely rounded apex, base oblique and also obtusely rounded, entire below the middle or the basal two thirds of the leaf, the average ones 3 cm long and one third as wide across the middle or the widest portion, glabrous except the midrib and nerves beneath, curing dull green on both sides, deeper green on the upper side when fresh and very distinctly marked with cystoliths, horizontally spreading or descending; midrib prominent beneath especially toward the base, gradually curved, dirty strigose beneath; basal pair of lateral nerves parallel with the edge and extending to about the middle of the length of the blade, obscure; the 2 to 3 extra pairs of lateral nerves from above the middle of the lamina, ascendingly curved from the midrib, very obscure, reticulations none; stipular bracts caducous, linear, about 5 mm long, pseudostrigose. Inflorescence grayish green, odorless; heads pistillate only, chiefly from the upper leaf axils, sessile, flattened, 5 mm across or smaller; outer pair of involucral bracts unequal in size, 2 to 3 mm long, 1.25 to 1.75 mm wide, membranous, united at the base, ovate to elliptic, apex acute, few nerved, green especially toward the rather thick point, pubescent on the outside; inner pair alternating with the outer pair, narrowly oblong, the middle region toward the apex green, hyaline margins densely ciliate; bracts around the inner region of the involucre 2 mm long, broadly lanceolate, greenish especially toward the acute apex, also densely hairy along the edges; flowers promiscuously spreading; bracteoles linear, varying from 0.5 to 1.25 mm in length, greenish toward the blunt apex, hyaline and smooth toward the base, more than the upper one half long ciliate; pedicel of ovary very short, greenish tinged, glabrous; ovary scarcely longer, fusiform, only as thick as the pedicel but deeper brown in color, at the apex provided with hyaline widely spreading hair-like stigmas.

Type specimen number 12421, *A. D. E. Elmer,* Magallanes (Mt. Giting-giting), Island of Sibuyan, May, 1910.

Collected in red soil packed in between rocks upon a seepage precipice along the Pauala river at 1750 feet altitude. Its local Visayan name is "Ulmian."

This number was distributed under *Elatostema sessile Forst.* but the late *Dr. C. B. Robinson* after studying the group in European herbaria informed me that it is a new species. The type specimen is in the Royal Botanic Garden of Edinburgh.

Elatostema surigaoense Elm. n. sp.

Perennial herbs; stems few from the same root, 2 cm thick, easily breaking, terete, dull green, 2 m high, branched from below the middle; main branches widely spreading or strongly bent, crookedly recurved, the ultimate ones suberect, quite freely rebranched, glabrate, curing blackish, the twigs when dry striate. Leaves descending, subcoriaceous, duller above, flat, terminated by a sharply pointed acuminate to caudate recurved apex, a trifle inequilateral, base obliquely broad cuneate or obtusely rounded, subsessile, very variable in size, entire below the middle, otherwise coarsely dentate to the apical point especially along the lower edge of the broader side, elongated or the smallest blades broadly lanceolate or nearly so, always broadest across the middle, the upper surface sprinkled with numerous minute cystoliths, also glabrous beneath except the few small strigose hairs along the midrib and nerves or even along the reticulations, the average ones 12 cm long by one fourth as wide at the middle, the young dark purplish tinged beneath when dry, otherwise curing ater on both sides; bud bracts linear and setaceously pointed, involute, 4 to 6 mm long, covered with grayish appressed hairs; midrib conspicuous beneath, also evident from the upper side, yellowish strigose and black when dry on the nether side; nerves along the lower side 5 to 7, the basal one arising from near the base and running 3 mm from the edge of the leaf, connecting with the first or middle ones, the upper ones merely ascendingly curved, their tips coarsely anastomosing and terminating in the teeth; the lower nerves of the upper or narrower side arising 1 cm from the base, similarly extending along the edge of the leaf though longer than its corresponding lower nerve, also coarsely anastomosing with the 3 to 5 nerves above the middle of the lamina, cross bars and reticulations numerous and quite evident from beneath. Florets numerous, the sessile clusters lateral or axillary, odorless, whitish when in anthesis; involucre disk-like, obscurely lobed, 1 cm across, subcoriaceous, glabrous, brown in the dry state, the lobes broadly elliptic; staminate flowers apparently in scattered groups surrounded by an involucel;

involucral bracts 2 mm long, several, hyaline and more or less united at the base, midnerve green and keeled toward the obtuse ciliate apex, obovate to obcuneately oblong, sides ventrally folded; the inner segments spathulately linear, shorter; pedicel hyaline, ultimately 2 mm long; perianth 4-segmented, 1.25 mm long, oblong, contiguous below the middle, terminated into a point, greenish toward the apex and ciliate along the edges; filaments 4, short when young and inwardly bent, slenderly elongated when old; anther 0.75 mm long, basifixed, lobed toward the apex, introrse in the bud state, exerted and reversed when in anthesis; pistillate flowers not seen.

Type specimen number 13637, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, August, 1912.

Gathered in stony ground of a deeply shaded sag at the base of the nearly precipitous incline of Cawilanan peak at 3500 feet altitude. The Manobo name is "Teoy."

This plant is quite distinct from my number 10514 collected in the mount Apo region and determined as *Elatostema integrifolia (Don) Wedd.*

Elatostema umbrinus Elm. n. sp.

Small tufts and forming scattering masses; stems 1.5 to 2 cm high, very flexible and herbaceous, reclining and taking root toward the base, dull green, dull brown when dry, seldom branched, glabrate, obscurely angular, the upper portion ascendingly curved or suberect. Leaves coriaceous, flat, quite numerous but only above the middle of the stem, when fresh velvety dark green above and much lighter green beneath, curing very unequally green on the 2 sides, in alternating rows, mainly horizontal, sessile, glabrous except the midrib and larger lateral nerves, the upper side covered with raised grayish white cystoliths which are more obscure from beneath, linear in general shape though the larger ones are distinctly broadened at the base and usually with an obscure lobe on the lower side which is either rounded or terminated into a tooth, 4 to 6 cm long, 7 to 10 mm wide toward the base or widest portion, oblique at the inequilateral base, gradually tapering toward the apex, entire around the base, otherwise subentire or obscurely serrately dentate especially along the lower side; midrib beneath umber brown and with similarly colored strigose hairs, above plane and covered with cystoliths; lateral nerves in the larger blades 9 to 13 pairs, the upper pairs faint, divaricate except the basal ascending pair, appearing short forked at their distal end, similar in color and much less strigose than the midrib, cross bars or reticulations none; stipule subhyaline, very membranous, glabrous, deciduous, 5 to 8 mm long, oblongish, apex slenderly or abruptly short pointed, very pale green in the natural state. Peduncle of staminate flowers 2 cm long, very slender, green, glabrous; involucral bracts 4, forming a broad quadrangular cup 7 mm long, nearly 5 mm wide, united below the middle, the basal middle portion green and with cystoliths, margins and irregular truncate apex hyaline, keeled on the back above the middle; flowers several to numerous, the mature ones slenderly pedicelled, the buds subsessile, all intermixed; pedicel hyaline, 3 to 4 mm long, subtended by an involucel; bracteoles very thin and transparent, 2, subequal, 5 mm long or less, 1.5 to 2 mm wide, oblongish or broadly lanceolate; perianth segments 4, also hyaline, 2.5 mm long, ovately oblong, with a greenish midrib toward the apex; stamens 4, apparently alternating with the perianth segments; filaments transparent, flattened, as long as the segments, with a strong inward bend from above the middle; anthers pale white, nearly 2 mm long, well divided from the base to the apex, inflexed in the bud state, brown back in anthesis and in the mature state recurved, easily detached, the individual cells subterete and oblong; female flowers not seen.

Type specimen number 13831, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September, 1912.

Discovered in wet deeply humus covered soil of dense forests in the vicinity of lake Danao at 5000 feet elevation. According to the Manobos its vernacular name is "Namancoyong."

This plant is a distinct species though it may be hard to differentiate it from *Elatostema variabile C. B.*

Rob. Its staminate bracts are not corniculate. Leaves thicker in texture, midrib and nerves beneath more conspicuous and distinctly umbrinus in color, shorter and relatively narrower, with cystoliths more prominent on the upper surface and whose stipules are twice as long as in *Dr. Robinson's* species.

Elatostema urdanetense Elm. n. sp.

Small scattered terrestrial tufts; stems 1.5 to 2 cm long, rather slender, usually only a few from the same root cluster, reclining at the base and bearing fibrous roots along the under side, dirty strigose toward the top, rather slender, very seldom branched, leaf bearing from above the middle toward the upper end. Leaves alternating, ascending or horizontal, the terminal ones largest, flat, coriaceous, glabrate on both sides, cystoliths more pronounced and whiter on the upper surface, very dark green above and very light green beneath even in the dry state, oblongish to obovate or subcuneately oblong, inequilateral, straight along the upper edge of the narrower side, broadly cuneate toward the obliquely obtuse base, 3.25 to 4 cm long, 1.5 cm wide across the middle or just above this, apex bluntly acute or merely toothed, entire except the crenately toothed edge from the middle to the apex or the wider lower side and only 2-toothed along the upper edge toward the apex, sessile, the basal leaves frequently much reduced; the midrib umber brown and occasionally strigose beneath in the dry state, extending nearly straight into the apex; the basal lateral pair of nerves arising from near the base but not opposite, extending along the margin a few mm below the edge of the lamina, their tips coarsely anastomosing with the 1 to 3 pairs of secondary nerves arising from the midrib above the middle, other reticulations very few, all similar in color and vestiture to the more prominent midrib; stipule subhyaline, oblongish, about 5 mm long, early or easily falling. Inflorescence upon ascending slender stalks, odorless, greenish except the watery white flowers, solitary in the upper leaf axils; pistillate not seen; peduncle 3 cm long, greenish and with minute purple spots or streaks, glabrous; head 1 cm across, broadly cup shaped; involucre of 2 pairs of very unequal oppositely arranged bracts, the outer bracts broadly ovate, 5 mm long, glabrous, united toward the base, minutely purplish spotted except the transparent margins, the green keel on the back rather conspicuous; the alternating pair of involucral bracts much narrower and more hyaline; staminate florets grouped in 4's, surrounded by involucels; bracteoles 4 mm long, obovately oblong, greatly varying in width, very thin and transparent except the evident midvein, truncately rounded at the apex; pedicels 3 mm long, transparent and ribbon-like, subtended by a whorl of thin hyaline secondary bracteoles which are a trifle shorter and relatively narrower than the primary involucral bracts; perianth 2 mm long, transparent, 4-segmented, the segments ovate to elliptic, with acute apices bearing a single spicule on the back; filament 1.5 mm long, short in the young state; anther 1 mm long, basifixed, divided toward the apex, the bud position becoming reversed in the process of anthesis.

Type specimen number 14249, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September, 1912.

Associated and mixed with the preceding species or number 13831, collected in the wet ground of darkly shaded forests in the lake Danao basin at 5000 feet altitude. Leaves thicker, their nerves beneath distinctly umbrinus and only one half as large as in *Elatostema carinoi Shaw*, the type of which has much shorter staminate peduncles.

Elatostematoides sublaxum Elm. n. sp.

Large suffrutescent tussocks; stems several, ascending from the base but the upper portion strongly recurved, 2.5 cm thick, terete, branched from near the base, 2 to 3 m high; bark dull green, smooth; wood dingy white, odorless and tasteless, with a large hollow pith; branches laxly rebranched and forming interlaced masses; twigs usually curved upwards, subterete and obscurely fluted, usually curved or twisted, glabrate when old, the younger ones puberulent and young tips strigose, curing dull blackish brown. Leaves alternatingly scattered along the numerous branchlets, descending, flat or shallowly curved upon the upper much deeper green surface, marked with cystoliths on the upper otherwise glabrous side, beneath puberulent or strigose along the midrib and nerves, grayish brown beneath and blackish brown on the upper surface when dry, the older ones subchartaceous while the younger blades are submembranous in texture, the larger ones 15 cm long by one third as wide, the smallest one is barely more than one third as large, gradually tapering toward the acute to acuminate recurved apex, the suboblique base obtuse to rounded, inequilateral especially below the middle, broadly lanceolate to subelliptic, entire at the base, otherwise crenate; veins 5 at about one third from the base, 3 arising from near the base but distinctly alternating, the middle or larger one branched 1 to 2 cm above the base, the upper branch straight and extending clear into the apex, the lower one from the middle or below it, yellowish gray strigose especially toward the base; cross bars and reticulations also prominent from beneath and raised, the outer cross or secondary branches interarching; petiole only about 3 mm long or subsessile, subolivaceus strigose; bud bract and stipule 7.5 mm long, caducous, slenderly pointed from near the base, glabrous and brown on the ventral and cinereous on the opposite side. Inflorescence sappy white, axillary or lateral, quite easily breaking, in the early state subtended by similar bracts upon subsessile or short stalked glomerules of diverse sizes; peduncle 3 mm long, almost 1 mm thick, green when fresh, puberulent, rigid; involucre apparently a small disk, coriaceous, 4 mm across, terminated into a few blunt points or teeth, minutely ciliate especially along the margins toward the apex, brown in the dry state though appearing transparently punctate; stamens promiscuously scattered, bud ovoid or subglobose and more or less ciliate; bracts of involucels very unequal in size, the longer ones 1.5 mm in length, conduplicate, oblong, few to several in a whorl, obscurely united at the base, obtuse, the smaller ones mere vestiges, sparsely ciliate; pedicel 2 mm long, flattened brown as its subtending bracts, ciliate along the edges;

perianth segments 5, united at the base and ultimately widely spreading; lobes oblong, obtusely rounded at the apex, membranous, brownish, persistent, ciliate on the dorsal side toward the apex and down along the edges; stamens as many, opposite the segments and inserted upon them at about the middle; filaments reddish brown, the basal one half adnate to the perianth segments, glabrous, the free portion 1.25 mm long and exerted; anthers also reddish brown especially the dark colored connective, almost 1 mm long, fully as wide across the base, ovoid, basifixed, laterally dehiscent, exteriorly curved, the emptied cells very widely spreading.

Type specimen number 13493, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, August, 1912.

Collected in loose very moist and more or less gravelly soil along streamlets of densely wooded ravines at about 3500 feet altitude. The Manobo vernacular name is "Catco."

Distinguished from *Elatostematoides laxum* (*Elm.*) *C. B. Rob.* by the pilose ends of the twigs, leaves with pilose nerves and more numerous veins which are differently arranged and with entire to crenate not dentate margins.

Laportea agusanensis Elm. n. sp.

Shrub-like tree; stem 15 cm thick at least, suberect, terete, 5 to 8 m high, branched from near the middle; wood very soft and pulpy, quite odorless and tasteless, yellowish tinged; bark smooth, yellowish brown and gray mottled, the inner portion wood color; branches divaricate, freely rebranched; the twigs slender, ascendingly curved toward their ends, glabrous. Leaves sublucid, horizontal, slightly recurved, diverse in size, the young ones very pale or light green, subcoriaceous, alternate, drying greenish on both sides, glabrous, apex rather abruptly acute or acuminate, base obtusely rounded or rounded, elliptically elongated, the larger lamina 4 dm long and 1.5 dm wide across the middle, the smallest lamina 12 cm long by 4 cm wide, entire; midrib broad beneath and curing darker brown, frequently purplish tinged, slightly raised along the upper side, glabrous; lateral nerves 7 to 9 alternating pairs, ascendingly curved from the midrib, relatively conspicuous, similar in color fresh or dry, cross and coarse reticulations faint; petiole varying 2 to 14 cm long, more or less grouped along the upper side, glabrous, pale green though brownish black when dry, glabrate or brown pulverulent, usually a trifle expanded at the base; bud bract erect or nearly so, much paler green beneath, glabrate, acuminately pointed, 7.5 mm long, involute. Inflorescence or infrutescence horizontally spreading, paniculate or subcorymbose, arising laterally in between the leaves or subaxillary, characteristically spreading over the twigs and foliage, not pendant, 1 to 2 dm long or wide; peduncle one fourth as long, usually solitary, glabrous, dull brown when dry; branches alternating, comparatively short, divaricate, similar in color when dry, green or lividus tinged in the fresh state, the lower or longer branches usually with a very short secondary branch arising from the same more or less thickened and expanded portion of the main stalk; larger branches similarly rebranched from the middle, the ultimate ones very short; distal ends of the ultimate branchlets of the infrutescence much compressed and expanded, glabrous, usually bearing small clusters of 3 pistillate florets; pedicels 2 mm long, subcompressed, glabrous, at the base subtended by mere bract vestiges, gradually enlarged toward the distal end; ovary solitary, sessile, tilted, subtended by a rim-like disk with 3 short and unequal teeth on the outer side, flattened, ovate from the side view, 1 mm long, extended into a 2.5 mm long slenderly tapering solitary stigma which along its ventral surface is distinctly pulverulent. The subtending involucre of the fruit twice as large, falling with it; carpel solitary, subpendant, dark green, smooth, subcompressed, ovoid, 5 mm less across the base, obtuse at the apex.

Type specimen number 14019, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, October, 1912.

Discovered in wet loose gravelly or stony ground along a streamlet in densely shaded or wooded ravines at 750 feet above ocean level. The Manobos call it "Sagay de Bungabung" or the Sagay along the Bungabung creek.

Later in the season I have seen beautiful tree specimens with profuse fruits in the fertile valley toward Cabadbaran.

Apparently belonging in the group with pedicelled female flowers and fruits.

Pellionia laciniata Elm. n. comb. *Elatostema laciniatum Elm.* Leaf. Philip. Bot. I, 287, 1908.

Pellionia sordida Elm. n. sp.

Stems forming dense rank masses, 5 to 7 dm long or high, dull green, puberulent especially toward the 1.5 cm thick base, sparingly branched from below the middle, usually reclining toward the more or less curved base, taking roots from the lower joints; branches divaricate, seldom rebranched, rather slender, the apical portion glabrous, obscurely angular or striate, curing nearly black, frequently a little zigzag. Leaves alternatingly scattered, 1 to 2 cm apart, dark green though lighter beneath, horizontal or descending, glabrous, ater when dry though duller on the upper side which bears minute cystoliths, subsessile or upon very short but distinct petioles, inequilateral especially toward the obtuse base, the upper side narrower and nearly straight, terminated by a slender acuminate point or tail, entire below the middle, that portion between the middle and the apical point coarsely toothed or serrately toothed especially along the lower edge, beneath appearing pulverulent, 12 to 15 cm long by 4 cm wide across the middle or the widest portion, frequently much smaller and even bract-like, fusiformly elongated; midrib nearly straight, plane above, rather conspicuous beneath, of the same color both in the fresh and dry state; lateral nerves about 5 to 7 on each side, the basal pair very faint, the upper ones divaricate and coarsely reticulate, the balance much ascending, with coarse cross bars and reticulations above the middle, usually with secondary entervening nerves extending from the midrib to one half way to the edge of the blade. Inflorescence ascending, axillary, solitary or few clustered; branchlets of the whole inflorescence short, glabrous, angularly compressed, stout, usually upon 1 cm long peduncles;

pistillate flowers clustered upon the somewhat congested ends of the branchlets, subtended by minute bract vestiges or ebracteolate; pedicels 1 to 3 mm long, subterete, glabrous, persistent, stout; florets articulate to the distal end of the pedicel; perianth 5-parted, the segments slenderly laciniate; ovary sessile, ovoidly elongated, terminated by 3 hair-like stigmas; fruiting perianth segments 4 mm long, well united around the base, broadly lanceolate, the apical 2 mm portion seta-like, brown and minutely purple spotted, glabrous, the sides ventrally folded especially toward the apex, rotately spreading with the slender point curved and twisted; staminodes flat, glabrous, opposite the perianth segments and inserted upon their bases, persistent with them, 0.75 mm wide, rounded or truncate at the distal end. Seeds lenticular, dirty brown, becoming easily detached, smooth, 1.33 mm across, sessile.

Type specimen number 14251, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, October, 1912.

Collected from large bowlders lying in the deeply shaded Catangan creek bed at 2500 feet altitude.

My number 13491 collected in this general region is certainly not the same species, though it is identical with *Pellionia laciniata Elm.* Neither do I think that our new species here proposed is the same as *Pellionia sinuata (Blm.) Boerl.* a very imperfectly known species.

Procris frutescens nervosa Elm. n. var.

Reclining shrub; stem nearly 5 cm thick, terete, 2 to 3 m high or long, crooked, branched from below the middle; wood dark brown, odorless and without taste, rather hard and closely grained, the duller brown pith quite prominent; bark relatively thick, brown, coarsely but deeply checked; branches reclining, freely rebranched, the ultimate ones slender and descending. Leaves heavy and succulent, descending or horizontal, very dark green and glabrous on the upper side, alternatingly scattered toward the ends of the twigs, much paler beneath and densely covered with minute cystoliths, the midrib nerves and reticulations provided with deep brown scales or scale-clusters, curing dull brown on both sides, slightly unequal toward the subcuneate base, obovately elongated, 2 dm long by 6 cm wide above the middle, obtusely rounded at the distal end and abruptly pointed, margins apiculate except toward the inequilaterally sided base; midrib raised beneath, scurfy brown; lateral nerves 11 to 15 pairs, also prominent and scurfy beneath, subparallel, the basal ones very oblique, distal ends of the upper ones curved, cross bars and coarse reticulations few and relatively obscure, also scurfy; petiole 1 cm long, prominently caniculate above, scurfy beneath even the young green portion of the branches; stipule caducous, equalling the petiole or less, sparsely sprinkled with scale like hairs, linearly oblong, after falling leaving prominent oblique excrescences. Staminate inflorescence subpendant, greenish white, solitary from the lower leaf axils, 1 dm long, corymbosely paniculate from the middle, all the branches as well as the peduncle fleshy and latericius scurfy, nearly black when dry; the short ultimate branchlets subtended by bracts; pistillate flowers in sessile greenish compressed heads from the upper leaf axils; staminate flowers subsessile or upon 0.5 mm long pedicels which are usually subtended by bract vestiges green except the dark brown scales; buds truncately obovoid; perianth tips overlapping the stamens, 5-segmented; segments united at the base, obovately oblong, reddish brown tinged, otherwise hyaline except the midvein, broadly rounded at the apex, gradually narrowing toward the base, the exterior especially the basal portion sprinkled with chocolate brown scales, the sides transparently punctate; stamens as many as segments, opposite them and inserted upon their bases; filaments incurved in the bud state, 2 mm long ultimately, glabrous, flattened, the middle line dark brown, sides hyaline though tinged with a little brown, rugosely folded or glandular along the upper side toward the apex; anther 1 mm long, apex truncate and the slightly emarginate base lobed, ovately oblong, attached a trifle below the middle, the cell walls also reddish brown tinged; pistillate heads flatly globose, sessile or nearly so from the upper leaf axils, 5 to 8 mm across; florets very numerous, dense, usually subtended by 0.75 mm long linear glabrous dark brown bracteoles; perianth 1 mm long, apparently 5-segmented, the basal one third united about the imbedded portion of the ovary, glabrous, nearly black in the dry state, the segments clavate; ovule sessile, brown, ellipsoid, 0.75 mm long, bearing a tuft of comparatively long brown stigmatic hairs.

Type specimen number 13602, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, August, 1912.

Discovered this interesting plant upon moss covered bowlders on the summit of Duros peak at 4000 feet height. Its Manobo vernacular name is "Marayhay."

Our leaves are larger and more numerously nerved than those of typical *Procris pseudostrigosa Elm.* and possibly merits specific rank rather than a variety of *Procris frutescens Blm.*

Procris urdanetensis Elm. n. sp.

Scandent and subepiphytic shrub; stem very flexible, crooked, 2 cm thick, terete, up to 3 m long, occasionally branched from near the base, usually from below the middle, repeatedly branched toward the top; wood soft, whitish, pith greenish and large, covered with smooth gray or yellowish gray bark; branches spreading or descending, rather long and somewhat drooping, 3 to 5 dm long; the glabrous twig ends green in the natural state, black when dry, appearing obscurely angular. Leaves numerous, alternating, horizontal or the lower ones descending, leathery, flat, the acuminate to caudate apex recurved, lucid and dark green above, much lighter green beneath, variable in size, coarsely and obscurely dentate between the middle and the apex, otherwise entire, glabrous on both sides, ater when dry, inequilateral especially toward the obliquely obtuse or obtusely rounded base, the average larger lamina 1 dm long by 3 cm wide across the middle, often much reduced, oblong or the smaller ones broadly lanceolate, with or without cystoliths beneath; petiole 1 cm long, green when fresh, nearly black when dry, glabrous, flattened and shallowly grooved along the upper side; stipule brown, also glabrous, setaceously lanceolate, 7.5 mm long, very early falling and leaving yellowish gray scars; midrib prominent beneath and covered with plain cystoliths, plane above; lateral nerves 4 to 7 pairs, much ascending and gradually curved from the midrib, tips of the upper nerves connecting, also prominently marked with cystoliths, cross bars or reticulations obsolete. Male inflorescence solitary, hanging from the lower leaf axils or lateral from below the foliage, 1 dm long, branched from above the middle; peduncle slender, blackish brown when dry, glabrous; lower branches usually forked, more or less clustered toward the ultimate ends, in the early state scurfy brown; flowers cremeus, glomerated toward the distal ends; pistillate flowers in dense flattish green subsessile axillary clusters; ultimate pedicel glandularly tubercular; staminate flowers subsessile or upon 0.3 mm long pedicels, the buds compressed globose, 2 mm in diameter; perianth 5-segmented, very thin and subhyaline, strongly arching over the stamens; segments almost 2 mm long, elliptic to obovate, united toward the base, apex rounded, midrib evident especially toward the apex, the outer or exposed ones occasionally with reddish brown glands, otherwise glabrous and not ciliate; stamens of an equal number and opposite the segments; longer filaments 1.5 mm in length, glabrous, dark brown, much flattened, linear, inserted upon the basal portion of the perianth segments, inflexed in the bud state; anther 0.75 mm long, fully as wide across the base, short ovoid, the cells much thicker and obscurely lobed at the base, obtuse at the apex, much lighter in color than the reddish brown connective. Fruiting heads whitish and succulent, the minute brown seeds sunken in upon the outside of the fleshy receptacles, sessile, 5 to 8 mm across, in the axils of the upper leaves, flattish globose; perianth composed of 5 segments; segments nearly free, 1 mm long, broadly clavate, dull greenish or in the dry state appearing nearly black, basal portion subhyaline, the broad or truncate apex usually with a minute point and a few glands; achene brown, fusiform or ellipsoid, 1 mm long, obscurely punctate, sessile, bearing a very short apical point, 0.5 mm thick across the middle.

Type specimen numbers 13792 and 13708, *A. D. E.*

Elmer, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September, 1912.

The first number was collected in the moss laden woods at 6250 feet altitude of mount Urdaneta and was called by the Monobos "Cawing-cawing." The last number was collected in very wet and stony soil of the dense forests at 5000 feet height in the lake Danao basin and was called "Pering" by the same natives.

Procris volubilis Elm. n. sp.

A low climber along small stems and over rotten stumps; stem the size of an ordinary lead pencil or thicker, flexible, terete though the larger ones are longitudinally fluted, crooked and inclined to twine, rather closely attached to its support, repeatedly branched toward the top; woody tissue white, pith large and greenish, covered with smooth grayish green bark; branchlets much curved, the longer ones drooping and rebranched, the apical portion pale green though nearly black when dry, glabrous, the tips ascendingly curved; roots from the under side of the stems and larger branches. Leaves flat, descending, thinly coriaceous, dark green above and much paler beneath, curing blackish brown on both sides, without cystoliths, glabrous, exceedingly variable in size, alternate, usually slightly inequilateral, the acuminate to caudate apex recurved, tapering toward the obtusely rounded base, elongated and usually widest just above the middle, that portion below the middle entire, otherwise bluntly dentate even along the apical point, the larger ones nearly 2 dm long by 7 cm wide across the widest portion, those on number 13856 considerably smaller; midrib prominent beneath, glabrous, flat above, black beneath when dry; lateral nerves 7 to 10 pairs, ascending, only a trifle curved, more numerous toward the apex, relatively prominent and similar in color, very obscure toward their distal ends, secondary intervening nerves and cross bars faint; petiole 5 mm long or less, glabrate or puberulent along the upper flattened side, ater when dry; stipule caducous, 1 cm long or shorter, membranous, glabrous, brown, folded, linear, setaceously pointed. Inflorescence odorless, scattered along the stem branches and even in the leaf axils, reddish tinged except the inner floral organs; staminate flowers subglobose and 2.5 mm in diameter, clustered toward the end of the ultimate branchlets, upon 2 to 3 mm long pedicels, becoming easily separated; pedicel glabrous, pale brown when dry, subterete, usually subtended by short acute fleshy bracts; perianth 5-parted, united below the middle, arching over the stamens, ultimately widely spreading; segments 2 mm long, elliptic, very thin and reticulate, obtuse at the apex and usually terminated by a minute point arising just below the edge or the outer bracts rather, prominently pointed; stamens as many, opposite the perianth segments; filaments almost 2 mm long in anthesis, inflexed in the bud state, band-like, hyaline, glabrous; anthers 1.5 mm long, lobed below and attached at the middle, apex notched and not as wide as the base, laterally dehiscent; pistillate flowers not observed.

Type specimen numbers 13856 and 13898, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September, 1912.

The former number was discovered in the very humid steep incline of Cawilanan peak at 4500 feet altitude and was named "Nonay" by the Manobos. The second number cited was collected in wet rocky ground of the wooded bank of the Catangan creek at 3000 feet. It is a much coarser plant though no doubt the same species.

The author is not certain as to the genus.

VERBENACEAE

Avicennia mindanaense Elm. n. sp.

Tree-like shrub; stem 3 to 5 m high, 1 dm thick, freely rebranched, the glabrous ultimate ones numerous and lax, forming dense masses; twigs relatively short, nodulose at the point of branching; bark very smooth, dull ashy gray; wood pale white, heavy, hard, burly, with a turniplike odor. Leaves easily becoming detached, coriaceous, slightly folded upon the upper surface, ashy green beneath and yellowish gray in the dry state, lucid and dull brown or blackish on the upper side when dry, opposite, rather numerous, the entire margins subinvolute at least when dry, gradually tapering to the sharp acuminate point, base obtuse or subcuneate, quite variable in size, broadly lanceolate to ovately lanceolate or occasionally elliptic oblong, the average blades 7.5 cm long by 2.5 cm wide across the middle or a trifle below it, frequently larger and occasionally smaller; midvein flattened but more conspicuous beneath; the lateral nerves and reticulations more evident on the upper side; petiole 1 cm long or longer, compressed, thick, glabrous. Inflorescence terminal, few and oppositely branched or occasionally verticellate, all the stalks grayish green, obscurely angular, thick and rigid, the young portion very finely puberulent; flowers sessilely clustered toward the ends of the ultimate branchlets, with a distinct orange odor; calyx subpersistent, erect, strongly imbricate, nearly free, canescent on the outer exposed sides, densely ciliate along the margins, deeply concave on the glabrate ventral side, ovately oblong or merely oblong, bluntly obtuse at the apex, 4.5 mm long, one half of that in width, the basal ones much shorter, yellowish green; corolla deep golden yellow, the constricted basal portion falsely united, glabrous, rigid, erect except the ultimate recurved lobes, fleshy, 4-5 mm long, 2.25 mm across the middle of the 4 subelliptic lobes; stamens also 4, alternating with the corolla lobes and inserted near the throat; anthers broadly oblong, 1 mm long, emarginate at the apex, bilobed at the base, dorsifixed; filament glabrous, 0.5 mm long, much tapering from the base to the apex; pistil 3 mm long, terete, much elongated, the basal one third glabrous, the middle one third densely cinereous, the apical one third glabrous and bluntly 2-pointed; fruits likewise green when fresh, turning yellowish gray when dry, ovoid and somewhat flattened, 2 cm long, nearly 1 cm thick at the base, containing a pair of thick greenish cotyledons.

Type specimen number 11990, *A. D. E. Elmer*, Davao, District of Davao, Mindanao, October, 1909.

In saline soil or in shallow brackish water along the coast in the town of Davao. "Mabaran" is the native name.

This number was distributed as *Avicennia alba Blm.* but its fruit is distinct from number 400 of *Mr. Bolster's* collection from the Surigao coast and which I take to be *Blume's* species.

Callicarpa attenuifolia Elm. n. sp.

Very lax shrub; stem solitary or few clustered, terete, suberect or spreading, branched from near the base; wood very soft, greenish white, odorless and tasteless, with a large white pith; old bark greenish, sparingly brown lenticelled; branches horizontally spreading, terete, green, avellaneus scurfy at least in the dry state, very slender and occasionally drooping. Leaves well scattered oppositely, descending, membranous, the gradually tapering acuminate or more commonly caudate tips recurved, only shallowly folded on the upper darker green side, slenderly attenuate toward the base, elongated or nearly fusiform in outline, when dry brown above and yellowish green beneath, both sides with glistening yellow minute glands, only the midvein, nerves and cross bars on both sides grayish pulverulent, the average or larger ones 2 dm long by 4 cm wide across the middle, entire toward the base and toward the apical point or tail, otherwise finally and rather sharply dentate; petiole 1 to 2 cm long, avellaneus scurfy or pulverulent, striate and fluted along the upper side, ascendingly curved from the base; midrib prominent beneath toward the base, grooved along the upper side, similarly scurfy or pulverulent; lateral pairs 9 to 12, much ascending and a trifle curved, also prominent beneath and similar in pulverulence, crowded toward the apex, very short at the base, tips anastomosing, reticulations quite evident and oblique or nearly so beneath. Inflorescence erect or divaricate, axillary but chiefly toward the top, bifurcate from below the base, 2 to 3 cm across; main stalks or peduncles proper 1 cm long at most, avellaneus scurfy, repeatedly forked at regular intervals, all the branches similar in vestiture and subtended by setaceous bracteoles, the ultimate ones bearing toward their distal ends small clusters of odorless flowers; buds truncately obovoid, their pedicels very short and becoming easily detached, thereby leaving conspicuous scars, subtended by 0.5 mm long linear bracts; calyx cup shaped, 1.25 mm long, 1 mm thick across the truncate or minutely apiculate apex, rather conspicuously 4-veined, with minute light yellow glands, its pedicel when in flower scarcely longer but densely covered with glands; corolla at most 1.5 mm long, turbinate, 1.25 mm wide across the top, glabrate or puberulent especially along the midveins, membranous, easily separating at the base, bluntly 4-toothed at the apex; stamens 4, alternating with the segments and inserted a trifle below the throat; filaments 1 mm long, thread-like, glabrous; anthers 0.75 mm long, 0.5 mm wide, basifixed, notched at the apex, lobulate at the base, flattened, dehiscent along the edges; ovary globose, 0.5 mm in diameter, densely covered with glands; neck 3 mm long, filiform, glabrous; stigma prominently expanded. Fruits globose, almost 2 mm in diameter, the basal one half tightly surrounded by the calyx, sprinkled with light yellow glands; seeds apparently only 2 or at most 4, compressed, 1.5 mm long.

Type specimen number 13536, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, August, 1912.

Gathered in a small open glen of rich soil among the woods along Giwantanan knoll at 2000 feet elevation. "Simadgimbajon" is the stifling Manobo name.

Callicarpa epiphytica Elm. n. sp.

Large epiphytic shrub; main stem 5 to 8 cm thick, ascending, 5 m long or high, crookedly rebranched; wood rather hard, whitish, a trifle sweet, odorless; bark gray, minutely checked and scaling, testaceous except the epidermis; branchlets ascending or horizontal, yellowish brown scurfy, subterete. Leaves opposite, copious, subcoriaceous, horizontal or descending, flat or only the slenderly and sharply acuminate apex recurved, the upper or smaller ones obtuse or occasionally obliquely obtuse at the base, the larger or lower leaves broadly rounded at the base, dull green when fresh and glabrous except the midnerve, when dry brown on this same upper side, beneath beautifully ochraceus scurfy or stellately puberulent in the fresh as well as in the dry state, the smaller ones broadly lanceolate, the larger ones ovately elongated, entire, the larger lamina 13 cm long and nearly 5 cm wide toward the base, the upper or smaller lamina less than one half as large; longer petioles 2.5 cm long, striate or angular, fluted along the upper side, densely ferrugineus scurfy or coarsely pulverulent; midrib similarly scurfy or puberulent on both sides, sunken along the upper side and prominently raised along the lower side; lateral nerves of the larger leaves 5 to 7, ascendingly curved, relatively prominent and yellow beneath, tips barely united, cross bars and reticulations quite evident from beneath. Inflorescence terminal and from the upper leaf axils; peduncle usually solitary, ascending, 5 cm long or shorter, similarly pulverulent, somewhat curved, with the forked branches 1 dm long or shorter; branches from above the middle, similarly forked toward their distal ends, subtended by 5 to 20 mm long linear or setaceous ochroleucus pulverulent ascendingly curved and subpersistent bracts; ultimate branches subtended by bracteoles, bearing a small cluster of flowers toward the distal ends; pedicels varying from 1 to 2 mm long, one half as thick, terete, densely covered by short stellate hairs; buds in the very young state globose, becoming elongated; calyx cup shaped, 3 mm deep and as wide across the 6-apiculate top, leathery, covered with a stellate puberulence and intermixed with some light yellow; corolla submembranous, 7 mm long, gradually expanded from the base toward the 6-segmented top, the calyx surrounded portion glabrous, otherwise the outer surface densely covered with light yellow glands and with a stellate puberulence; lobes imbricate in the bud state, oblong, obtuse at the apex, glabrous on the inner sides; stamens 6, included, alternating with the segments; filaments slender, 2.5 mm long, glabrous, inserted upon the basal portion of the corolla, compressed and slightly wider at the base; anthers equalling the filaments, oblong, 1 mm wide, apex truncately rounded and obscurely emarginate, basifixed and bilobed at the base, dehiscing along the edges, the connective on both sides strewn with light or pale yellow glands; ovary 1 mm wide across the flattish gland covered top; style terete, fleshy, 4 mm long, curved and twisted toward the base; stigma capitate, subglobose, pulverulent. Fruits globose, 4 mm in diameter, three fourths surrounded by the calyx, the apical or exposed portion apparently glandular.

Type specimen number 13822, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September, 1912.

Discovered this epiphytic shrub upon the lower large limbs of moss covered lofty trees in the very humid forested basin just above lake Danao at 5250 feet altitude. "Madolau" is its Manobo name.

Number 13861 was collected in stony ground along the ridge between Duros and Cawilanan peaks at 3500 feet elevation. It was a small slender erect tree and not at all epiphytic, otherwise the two numbers represent the same species.

Closely allied to *Callicarpa flavida Elm.* but leaves always broadest below the middle or toward the base and with other minor characters.

Vitex curtifrutescens Elm. n. sp.

A stocky tree; trunk 6 dm thick, 12 m high, branched from below the middle, forming a dense elongated brown; main branches widely spreading, rebranched all along, the ultimate ones yellowish gray and from 1 to 2 cm thick; bark gray with brown blotches, rather finely checked; sapwood white but very thin, the balance brownish, brittle, very hard and heavy, closely grained. Leaves widely spreading, diverse in size, nearly flat, descending, the entire margins more or less wavy, the abruptly acute to acuminate apex recurved or only obtusely rounded, base broadly cuneate or obtuse, obovate to obovately oblong. glabrous, drying blackish brown, the more exposed leaves strongly conduplicate on the upper darker green side, lamina 2.5 cm wide above the middle, the larger ones measure 6 dm long, alternatingly crowded toward the ends of the twigs; midvein raised beneath, plane on the upper side, yellowish green, glabrous; lateral nerves 7 to 11 but usually 9 pairs, very oblique, similar in color and prominence, usually branched along the lower side from above the middle toward their ends, ending in coarse reticulations, the cross bars few and also conspicuous, reticulations relatively fine and equally visible from both sides; petiole subterete, ascending, glabrous, yellowish green in the fresh state, somewhat swollen at the basal point of the blade, from 5 to 10 cm long. Infrutescence erect or at least ascending, 7 to 13 cm long, strict; stalks rigid, glabrous, thick, yellowish gray, usually solitary from the leaf axils; fruit upon stout 5 mm long pedicels or subsessile, hard, smooth, similar in color, 2 cm across, normally somewhat compressed, 2-seeded.

Type specimen number 10994, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, June, 1909.

Discovered in dry fertile soil along the wooded edge of the Baracatan creek at 1500 feet altitude or at the upper limit of the cogon field. The Bagobo name is "Magamabut."

Vitex premnoides Elm. n. sp.

Quite a large tree; trunk 17 m high, mostly branched toward the top; wood soft, yellowish especially toward the center, odorless and tasteless; bark thick, smoothish, brown, yellow beneath the epidermis; main branches spreading but not very long, quite often rebranched; twigs horizontally spreading, green and puberulent on the young tips, the ultimate ones ascendingly curved. Leaves along the twigs only, opposite, deeply folded upon the upper deep green and lucid surface which in the dry leaves is ater, exceedingly variable in size, apex abruptly acute and strongly recurved, base obtusely rounded, oblong or subelliptic, the larger blades 7.5 cm long by 3.5 cm wide, edges entire, much lighter green beneath when fresh and dull grayish brown when dry, glabrous above, nearly so beneath; petiole 1 cm long, finely canescent when young, glabrate when old, caniculate, usually with interaxillary buds, leaving large gray scars after falling; midrib prominent beneath, sunken above, in the young state appressed puberulent; lateral nerves 5 to 7 pairs, ascending and curved, relatively conspicuous beneath, cross bars very faint, reticulations exceedingly minute. Paniculate inflorescence terminal, erect or suberect, 5 to 8 cm long and fully as wide, branched from below the middle, usually with only a single stalk or peduncle and subtended by a pair of small leaves; branches opposite, widely spreading, subtended by sharply acuminate appressed yellowish pubescent bracts, rebranched from above the middle, similarly appressed pubescent, ultimate branches nearly at right angles and at their distal ends bearing a small cluster of flowers; pedicels 1 to 3 mm long or longer, olivaceus pubescent, subtended by bracteoles; calyx turbinate, dark green, 2.5 mm long, obscurely 4-angular, concrete except the spreading 4 short teeth, glabrate or yellowish gray puberulent, at the base subtended by a pair of short but sharply pointed persistent bracts; corolla bud globose, yellowish; segments 4, yellowish, alternating with the calyx teeth, valvate in the bud state, ultimately becoming reflexed and early falling, subequal, triangular in shape, the larger ones 2.5 mm long and 2 mm wide across the base, glabrate or nearly so, acute at the apex or subrounded; stamens also 4, alternating with the petals and occasionally inserted upon their bases; filaments whitish, 2 mm long at least, glabrous, compressed toward the base, pointed toward the apex; anther yellow, 1 mm long, rotund, almost as wide, truncately rounded at the basifixed base, laterally dehiscent; ovary crown light yellow, thick and fleshy, glabrous, conspicuously rugose; style central, erect, thick, likewise glabrous, ridged longitudinally, apex irregularly truncate.

Type specimen number 11644, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, September, 1909.

Discovered in moist fertile ground of dense woods at 4000 feet altitude and along the northern bank of the Baruring river. The Bagobo name is "Lamog."

Possibly it should be referred under *Premna* rather than under *Vitex* and to be compared with species belonging to the *Premna nauseosa Blco.* group.

VIOLACEAE

Alsodeia dubia Elm. n. sp.

A rather large tree; trunk 8 dm in diameter, 17 or more m high, terete, straight, with branches arising from the middle; wood odorless, slightly bitter or without taste, moderately hard or soft, the thin sapwood white, the heartwood reddish tinged; bark thick, smooth, brown on the trunk, gray on the branches, otherwise castaneus; main branches few and widely spreading; twigs not numerous, very slender and lax, horizontal and descending, appearing a trifle zigzag, puberulent, yellowish brown when dry. Leaves coriaceous, similarly spreading, in alternating distichous rows, copious, the very abruptly acute apex recurved, broadly obtuse or rounded at the base, oblong or subelliptic, quite variable in size, entire, fuligineus in color on both sides when dry, the larger ones 12 cm long by 4.5 cm wide at the base, the smaller ones one half as large, glabrous, much deeper green above; midrib prominent beneath, also slightly raised on the upper side toward the base, very deep reddish brown on the dry specimens, in the young state puberulent, ultimately glabrate except along the sides; lateral nerves 5 to 7 pairs, much ascending though only slightly curved, comparatively prominent, cross reticulations obscure; petiole 5 to 8 mm long, thick, caniculate, bark covered, glabrate when old. Flowers ascending, odorless, usually in dense clusters of the leaves; pedicels none or short and very thick; calyx 5 mm long, short yellowish green pubescent or puberulent on the outside only, more or less united at the base, angularly rugose; segments 5, oblong, averaging 2 mm wide, imbricate in the bud, rigidly coriaceous, the margins much thinner, the median portion of the inner segments almost ridged along the back, rounded at the apex, elliptic or merely oblong, slightly unequal in width; petals 4.5 mm long, oblong, narrowed at the base, rounded at the apex and occasionally minutely notched, 1.5 mm wide, merely pubescent on the back, densely villous on the whole inner surface, frequently becoming twisted, coriaceous, deciduous; ovary surrounded by the densely pubescent stamineal tube which is nearly 3 mm long and distinctly stipitate at the base; stamens about 8, inserted upon the truncate apical portion of the ovary with the stamineal tube; filaments 1 mm in length, long pubescent; anther 1 mm long, 0.75 mm wide, oblong, basifixed, base truncately rounded, apex minutely mucronate; stigmas composed of several linear more or less pubescent segments; stamineal tube at the base surrounded by 5 hard glabrous wedge shaped 1 mm long dark red or brownish glands.

Type specimen number 13956, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September, 1912.

Collected this big tree in the forested saddle between Duros and Cawilanan peaks at 3500 feet altitude. Its Manobo vernacular name is "Badabogon."

Rather uncertain as to the right family and may possibly belong to *Flacourtiaceae* or rather to *Icacinaceae*.

Rinorea fasciculata minor Elm. n. var.

Small or medium sized tree; stem 2 dm thick, 10 m high, branched toward the top and forming on elongated dense crown; wood hard, heavy, brittle, yellowish white, bitter and nearly odorless; bark smooth, grayish white mottled, relatively thick, reddish brown on the inner side; branchlets numerous, quite short, bendable; the twigs green, glabrous, angular and zigzag. Leaves subchartaceous, hanging, curvingly folded upon the upper green surface, glabrous, copious, alternatingly scattered, curing dull green on both sides, the basal margin entire, above the middle obscurely serrate, the serratures usually black callous pointed, acute at the apex, broadly obtuse or obtusely rounded at the base, oblong or subelliptic; the average lamina 1 dm long by 4 cm wide across the middle; petiole also glabrous, 5 to 8 mm long, yellowish brown when dry, deeply caniculate; midrib similar in color, smooth; lateral nerves much ascending and curved, 7 to 9 pairs, evident from above, prominent beneath, tips obscurely united, with fimbriate glands in the axils, otherwise glabrous, cross bars fine and obscure. Flowers fascicled from short thick tubercles in the axils of the fallen leaves; pedicels slender, unequal in length, the longest 1 cm long, glabrous, strict, spreading, subtended at the base by a series of very blunt bracts; calyx glabrous, shallowly cup shaped, imbricated and united at the base; segments 5, ovately elliptic, broadly obtuse at the apex, densely purplish spotted especially in the middle basal region, 2.25 mm long, 1.25 mm wide toward the base; corolla erect, slightly imbricate, nearly free, as many as there are calyx segments, 3.5 mm long by 1.5 mm wide across the base, ovately elongated, glabrous, rounded at the apex, similarly spotted all over, sides more or less folded or rolled upon the ventral surface; stamineal rim 0.5 mm wide, glabrous; stamens 10, erect; filaments 0.25 mm long, arising from the edge of the rim, also glabrous, 1.25 mm long, auriculately truncate at the base, flattened, dehiscing laterally, the connective expanded at the apex by a conspicuous purplish streaked and finely lacerated membrane; ovary 2.5 mm long, short ellipsoid, glabrous, bearing a terete 1 mm long striate style, about 4-ovuled. Fruit in axillary fascicles, ascending or divaricately spreading, upon green axillary tubercles usually provided with a series of small bracts; pedicels very slender, 1.5 cm long, glabrous, strict; capsule green, 3-seeded, shining, obcurely 3-angled, otherwise nearly globose, 1 cm long, terminated by a conspicuous point, subtended by the rotately spreading 5-lobed calyx rim and by the subpersistent oblong petals, both the middle dorsal region of the calyx segments and the free petals cinereous.

Type specimen numbers 12724 and 12793, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, March, 1911.

Collected the first or flowering number in dry compact soil of light woods at 50 feet altitude. The latter or fruiting specimens were found in gravelly soil along wooded stream banks at 250 feet elevation.

This species and variety may more properly belong to *Euphorbiaceae* than to *Violaceae*.

Viola apoense Elm. n. sp.

Annuals, more or less creeping by stolons or runners, occasionally forming patches; stolon slender, glabrous, straw brown on the dry specimens, greenish when fresh, up to 8 cm long; rootstock or underground stem suberect, 1 to 3 cm long, amply provided with fibrous roots. Leaves ascending, alternatingly clustered toward the distal ends of the rootstock, scattering in all directions; petioles very slender, varying from 1 to 3 cm long, somewhat compressed and winged especially toward the blade, green toward the distal end even when dry, yellowish brown toward the subglabrous base, otherwise strigosely ciliate; stipular bracts apparently interaxillary and more or less sheathing the stem or adnate to the petiole, few mm in length, the linear adnate stipules slenderly 1-toothed, the free oblongish axillary ones slenderly and pectinately toothed, yellowish brown, nearly glabrous; blade orbicular, 1 cm wide, with a broad cordate sinus at the base, crenate or only obscurely so, crisply strigose along the veins, otherwise glabrous, flat, membranous, paler green beneath; veins in the average lamina 5, the middle one straight and extending to the apex, with 1 lateral pair from the middle; the 2 basal lateral pairs arising from near the base and divaricately or obliquely spreading, all the lateral ones usually forked or branched toward the distal ends. The short stalked flowers near the rootstock bearing the crown of leaves, when in fruit slenderly stalked and horizontally spreading; peduncles usually solitary, arising from the axils of the basal leaves or branches, varying from 1 to 2 cm long, recurved at the distal end at least in the fruiting state, the middle portion light green and with hyaline margins, more or less compressed, sparsely ciliate, provided with a pair of bracts at about the middle; bracts 5 to 7 mm long, linear, 0.75 mm wide, apex pointed, with a green midrib, sides hyaline and similarly ciliate along the edges; calyx 3.5 to 4.25 mm long, at the base united into a disk-like expansion and each segment extended into a broadly rounded 1 mm long green and hyaline ciliate margined basal membrane; the free portion of the 5 segments 3.25 mm long, 1 mm wide at the base, gradually tapering from the base to the rather fine point, with 3 greenish parallel veins, otherwise hyaline and similarly ciliate along the margins, withering though subpersistent; corolla not seen. Capsule short, trigonous, ellipsoid, 3 mm long, also glabrous, pale green or whitish, loculicidally dehiscent from the apex clear down to the base; carpels much concavo-convex, terminated at the apex by a short incurved point, subpersistent, the partitions of the 3 cells not completely extending to the center; ovules several in each cell, brown, usually elliptic, somewhat compressed 0.75 mm long, usually congregated along the septae.

Type specimen number 11544, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, August, 1909.

Forming patches or solitary upon moss covered bowlders strewn along the Cati creek at 5750 feet altitude or just above its first of a series of falls on the east or northeastern side of mount Apo. "Tasik" in Bagobo.

Apparently distinct from all other Philippine species of violets.

VITACEAE

Cissus apoensis Elm. n. sp.

A shrubby tree climber; leaf bearing branches 1 cm thick, subterete, densely castaneus hairy, young branches long and slender. Leaves opposite or tendril opposed, ascending or horizontal, well scattered; petiole almost 1 dm long, terete or nearly so, not so prominently ridged as the branches; leaflets 3, coriaceous, densely soft tomentose beneath, very short hairy above, the terminal one longer and symmetric, all abruptly terminated into a narrow and acuminately pointed apex, the terminal leaflet elliptic in outline, the lateral pair of leaflets inequilateral and broadly rounded at the base, 1.5 dm long at least by 12 cm wide, subentire around the base, otherwise coarsely and irregularly dentate, the lateral pair at the base oblique and occasionally a trifle cordate; lateral petiolule thick, 1 cm long, the terminal one twice as long, latericius tomentose, flattened along the upper side, becoming easily detached; midvein straight to the apex, usually with 3 lateral basal veins on the broader and only 1 lateral basal vein on the narrower side, the 5 other lateral pairs of nerves ascendingly curved, the larger of the basal lateral nerves branched along the lower side, cross bars and few coarse reticulations comparatively obscure, becoming however more evident in the old leaves as the indumentum wears down or off entirely. Inflorescence along the slender twigs, opposed by a reduced leaf, 2 dm long, 3-branched toward the apex; peduncle terete, finely ridged, dark brown pubescent, frequently articulated above the middle and with a pair of bracts; branchlets 5 to 8 cm long, compressed and grooved along the sides, easily separating at the base, distichously rebranched above the middle, the ultimate ones short and expanded at the point of branching; flowers odorless, greenish, usually few clustered from the more or less thickened distal end of the last branchlets, subglabrate; pedicel with the calyx 4 mm long, the basal 3 mm pedicel-like, more or less ridged toward the much broadened distal end, usually curved, puberulent; the calyx portion 3.5 mm wide, disk-like and 4-apiculate, rigid; corolla truncately conical and falling off as a hood, more or less angular, the basal one half portion thinner in texture and united though the 4 lobes usually separate from the base toward the apex, externally pulverulent below the middle, puberulent toward the apex, 4 mm long, the edges above the middle with conspicuous inwardly extending membranous wings, segments obtuse at the apex; stamens 4 or of an equal number as there are corolla and calyx segments, apparently opposite the petals; filaments 2.5 mm long, glabrous, much dilated at the base, curved or twisted especially at the apex; anther oblong, 1.33 mm long, basifixed, well encased by the petal margins, bilobed, laterally dehiscent; ovary much compressed, likewise glabrous, 3 mm thick, sunken across the truncate apex, sparsely glandular, obscurely 4-lobed, black and rugose around the outside; style erect, arising from the middle of the ovary, 1.5 mm long, terete, light yellow, occasionally gland punctate, thickest at the base, terminated by a small truncate stigma.

Type specimen number 11696, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, September, 1909.

Collected in damp forests at 4000 feet altitude along the trail to mount Apo. "Sumagisig" is the Bagobo name.

Leea agusanensis Elm. n. sp.

Lax undershrub; stem 1.5 to 2 cm thick, crooked, 2 or even 3 m high or long, usually inclining, very sparingly branched toward the top, glabrous, obscurely striate and brown lenticelled, ater when dry. Leaves few, alternating toward the ends of the stem and branches, horizontal, subcoriaceous, the upper one about 4 dm long, 5 to 7-foliate, imparipinnate; petiole 6 cm long, subterete, dull green and ater when dry, obscurely striate, in the early state puberulent or finely scurfy, the rachis a trifle angular and extended beyond the upper pair of the leaflets, otherwise similar in color and vestiture; the terminal leaflet largest, the basal pair either much reduced in size or only a little smaller than the upper pairs, elongated, the average blades 7 cm wide across the middle or widest portion, both ends obtuse at the base, acute to acuminately pointed at the apex, entire toward the base, otherwise dentate or serrately toothed especially toward the apex, curing lighter brown beneath, the upper nearly flat side very dark green in the natural state; petiolule of the lateral leaflets 5 mm long, those of the terminal leaflet longer, thick, distinctly channeled along the upper side, similar in color when fresh and when dry to that of the rachis, ultimately glabrate; midrib ridged beneath, even a trifle raised along the upper side, also glabrous and dull brown in the dry state; lateral nerves 10 to 12 pairs, oblique, much less prominent beneath yet plainly marked along the upper side, tips ascendingly curved and usually terminating in the marginal teeth; cross bars very numerous, fine, plainly visible on the nether side. Inflorescence lateral on our type or between the uppermost developed leaf and the apical young leaf, 5 cm across, 3-branched from near the base; peduncle proper 3 to 5 mm long, fulvus hairy, relatively very thick, subtended by a caducous rim-like more or less brown hairy involucral bract; main branches similarly pubescent, the lateral longer and nearly at right angles, rebranched from above the middle; ultimate branches thick, angular, short, fulvus pubescent, also subtended by caducous bract vestiges, bearing a small cluster of flowers toward their distal ends; pedicel 1 to 3 mm long, brown, puberulent, subtended by bracteoles; calyx 6 mm long including the 2.5 mm long stipitate base, obscurely angular, glabrate or pulverulent, the calyx proper deeply campanulate, 3 mm wide across the 4-toothed apex; segments ovately oblong, rounded at the apex, subcoriaceous, usually recurved; corolla 5 mm long, parted into 5 lobes, turbinate and united below the middle, glabrous but finely punctate on the dorsal side; segments valvate in the bud state, coriaceous, broadly oblong, obtuse at the apex, one half the length of the entire corolla, alternating with the calyx series, the apex thickened upon the ventral side, rotately spreading; stamens 4, erect, in the young state united with the basal portion of the corolla; stamineal tube erect, fleshy, glabrous, at least 3 mm long, relatively very thick, the quarters notched at the apex; filaments compressed, inserted at the basal outer side of the stamineal tube, rather slender, glabrous, closely appressed and extending over the apical sinus of the stamineal tube, spreading in anthesis; anther reflexed into the stamineal tube before and reversed after anthesis, basifixed, connective pointed at the apex, oblong, subterete, 2 mm long, dehiscing laterally; cells thin, introrse in the bud state, extrorse subsequently; imbedded ovary globose, 1 mm in diameter, glabrous; style with capitate stigma 3 mm long, both glabrous and fleshy. Fruits upon much elongated and somewhat thickened lenticelled stalks, 1.5 cm thick, globosely compressed and roundly 4-lobulate, glabrous, normally 4-seeded, otherwise rather succulent and soft when mature; seeds stone-like, 6 mm in diameter, subglobose.

Type specimen number 13500, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, August, 1912.

Discovered in wet poor or stony ground along a streamlet coursing through the densely humid *Dipterocarpaceae* forested flat at 750 feet above sea level. "Mamali" in Manobo.

Manifestly nearest related to my *Leea congesta* of Luzon yet there are a number of good specific differences.

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NOTES AND DESCRIPTIONS OF ZINGIBERACEAE

by

A. D. E. ELMER

Adelmeria alpinum Elm. n. sp.

Small tufts; stems ascending, 1 to 2 m high, 1.5 to 2 cm thick, swollen at the base, dark green. Leaflets subsessile, ascending, thinly subchartaceous, rather straight, dull green on the upper deeply conduplicate side, almost flat, paler green beneath, glabrate on both sides, curing dull brown, margins coarsely undulate and occasionally a trifle ciliate, linear to lanceolate in shape, 2 to 4 dm long by 3 to 5 cm wide, gradually tapering to the acuminate apex, base obtuse or nearly so, the terminal or younger leaves purplish beneath, scattering and alternate, toward the base much reduced even to small bracts; sheath split, margins glabrous, thin and dark straw brown or purplish toward the ligule, striately ridged along the dorsal middle portion, glabrate, easily separating from the stem especially while curing; ligule 1.25 cm long, quite variable in size and shape, ovately oblong or triangular, acute to acuminate, occasionally obtuse, somewhat decurrent, glabrous, reddish when fresh, occasionally irregularly toothed or even margined. Heads terminal, erect, ovoid, 5 to 8 cm across, upon a short peduncle subtended by one or more foliaceous bracts; bracts greenish red, glabrous except the strigulose margins, oblong or the inner ones widest across the top, 3 cm long by one third as wide, conspicuously nerved and reticulated, the apex quite often irregularly subtruncate: bracteole utricular and enclosing 2 flowers of unequal developement, 1.5 cm long, 1 cm wide, thin, yellowish, puberulent on the exterior, the upper one third bifid or split, broadly oblong when spread out; calyx nearly 2 cm long, red especially toward the top, glabrous, thickest across the 3 toothed top, the slender teeth usually ciliate; corolla 3 cm long, slenderly tubular, glabrous, rigid, light yellow except the whitish basal portion; the 3 outer segments spreading, unequal, triangularly ovate to oblong, the longer one 7.5 mm in length, all glabrous; lip suberect and curved, fleshy, yellow, slightly bifid at the apex, strongly curved and twisted in the dry state at least, 1 to 1.5 cm long, 4 mm wide, margins inwardly curved; filament short and broad; anther 4 mm long, dorsally recurved, truncate and obscurely emarginate at the apex, the light yellow cells longitudinally dehiscent; style slender; stigma glabrous and subcapitate; ovary glabrous, triangularly elongated. Fruit hard and shinning dark green, subtended by persistent rather flexible broadly obtuse reddish green bracts, 2 cm long by 1.5 cm wide above the middle, obovoid and irregularly subcompressed, short stipitate, apex usually excavated about the persistent calyx, obscurely 3-celled; seeds several in each cell, irregularly round, 3 mm across, glabrous, dull brown, deeply hollowed at the point of attachment.

Type specimen numbers 10642 and 10534, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, May, 1909.

Here and there met in the forests. The former number was collected at 7000 feet altitude on the north side of the Sibulan river on mount Calelan and was called "Pusadok" by the Bagobos. The latter number at 4250 feet altitude south of the Sibulan river and was named "Lurasising" by the same natives.

Very distinct from the other two species of this characteristic alpine genus.

Alpinia foxworthyi Ridl.

Field-note:—Dense tufts in compact black soil and with a gravelly subsoil in open grass lands interspersed with shrubs at 250 feet, and usually along dry stream depressions; stems erect, strict, terete, glaucous green, less than 0 5 inch thick, 3 feet high yet both higher and lower, the upper one third leaf bearing; leaves ascending, coriaceous, strongly folded upon the upper side, slightly paler beneath; inflorescence erect, terminal, densely flowered, the young rachis, pedicels and ovaries citrineus, the peduncle and old ovary or young fruit turning green, otherwise the odorless flowers stramineus except for the pale red or roseus streaks along the upper side of the inner lower lip; fruit subglobose or elongated, always less than 0.5 inch long, black when mature on the plant, soft and mealy, with 4 castaneus angular seeds.

Represented by number 12930, *Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, April, 1911.

Alpinia rufa (Presl) K. Schum.

Field-note:—Small delicate tufts in rich moist humus covered soil of a densely forested ridge at 3750 feet, on the Talon side of the mountain range; stems few to several, ascending, recurved toward the top, terete, green, the thickness of an ordinary lead pencil, 3 to 5 feet long; leaves alternatingly scattered, the basal ones reduced and more scattering and extending to below the middle, the largest ones toward the apex, slightly descending and recurved, tips abruptly so, otherwise flat, membranous, sublucid and smooth above, soft pubescent beneath; inflorescence terminal, ascendingly curved; pedicels divaricate, surrounded by bracts which soon become dry and brown; flowers white, delicate; fruit globose, less than 0 5 inch in diameter, bright red when ripe; seed black, surrounded by a white mealy coating. "Caucos" in the Bagobo dialect.

Represented by number 11888, *Elmer*, Todaya (Mt. Apo), Mindanao, September, 1909.

A very distinct *Zingiberaceous* plant in its subalpine habitat throughout mountainous wooded or forested regions.

At nearly all times of the year it can be found in flower and fruit. The marcescent scales or sheaths on the branches of the inflorescence or infrutescence is characteristic. The small flowers are white or nearly so and the color of the mature fruit is of a very pleasing goose berry red.

Alpinia apoensis Elm. n. sp.

Low terrestrial and perennial herbs, forming more or less patches; rhizomes crookedly branched, rigid, less than 1 cm thick; stems terete, 5 to 8 mm thick, green except the brownish sheaths toward the base, 3 to 5 dm high. Leaves submembranous, horizontal or slightly ascending, dull green above, a trifle paler beneath, flat except the strongly recurved sharply acuminate tips, edges wavy, alternatingly scattered every 3 to 5 cm, curing unequally dull brown on the two sides, base rounded, oblong or ovately oblong, the largest ones 15 cm long by 5 cm wide across the middle, most of them only 10 cm long and 3 cm wide, the terminal blade reduced, pulverulent on both sides, pubescent along the midrib; petiole 5 mm long, caniculate along the upper side, puberulent or yellowish pubescent especially beneath; sheaths overlapping, well separated toward the top and striate, puberulent except the lower smooth portion, edges thinner but not hairy; ligule 5 mm long, erect, fully as broad, notched, puberulent and only sparsely ciliate around the apex. Flowers unknown. Infrutescence 4 to 7 cm long, the pedunculate basal one third dark green, dirty short pubescent, terminal, the rachis portion ascendingly curved, spicate or the more rank ones few and short rebranched toward the base, rigid; pedicels rather numerous, alternating, ascendingly curved, 3 mm long or less, dirty puberulent, ebracteolate, thickened at the distal end; fruits bright green, then light yellow, ultimately dull red, 7 5 mm long, smooth and glabrous, ovoid when fresh, rather obovoid in the dry state.

Type specimen number 11889, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, September, 1909.

Collected this rare unique *Alpinia* in moist rich humus covered soil on a steep forested slope at 4000 feet altitude on the Talon side of the mountain range. The native or Bagobo name is "Otin-otin".

Alpinia romblonensis Elm. n. sp.

Rather dense tussocks; stems 2 m long, 1.25 cm thick, bulbose at the base, bracteate clear to the base, connected with thick horizontally rebranched roots. Blades alternate, 5 to 8 cm apart, the lower ones more scattering and much reduced, horizontally spreading, very deep shining green on the upper nearly flat surface, the twisted and usually recurved tips setaceously acuminate, the margins undulate and reddish brown, sessile, obtusely rounded at the base, curing grayish on both sides, ovately oblong, the larger blades 2 dm long by 5 cm wide below the middle; midrib pronounced beneath and grooved on the upper side toward the base; sheath overlapping, well separated toward the throat, obscurely striate, the thin margins stramineus; ligule auriculately truncate, only a few mm long, reddish brown, glabrous. Inflorescence terminal, spicate, pendulous though the odorless flowering tip ascending, 1.5 dm long including the stalk; peduncle 7 cm long, terete, green, glabrous, subtended by an oblong leaf-like sheath; rachis as long or even twice as long, greenish, glabrous, angular, drying blackish brown; pedicels varying from 1 to 5 mm long from the flowering to the fruiting state, ascending, disk-like at the distal end, divaricate; exterior of the small ovary glabrous; calyx yellowish green, glabrous, 12 mm long, broadest across the bilobed apex; corolla dull creamy yellow, glabrous, the thick tube 1.25 cm long; the outer 3 lobes oblong, 1 cm long, with incurved obtuse tips, the upper one erect and broader, the lateral ones reflexed, all glabrous, the inner single lobe thicker and longitudinally nerved; anther sessile, curved, nearly 6 mm long, with a thick broad connective which is truncate at the apex, dark reddish brown when dry; anther cells tapering toward both ends, yellow, longitudinally dehiscent; staminodes apiculate; stamineal tube hairy on the inside above the middle; thread-like style sparsely hairy, bearing an exerted obconic stigma; ovary 2.5 mm long, almost as thick, glabrate, truncate at the apex and very obscurely notched. Fruit hard, deep green, 1.5 cm in diameter, globose, glabrous, bearing the persistent calyx.

Type specimen number 12050, *A. D. E. Elmer*, Romblon, March, 1910.

In gravelly ground along stream banks near the sea. "Tagbag" is the local Visayan name. This same native name is applied to many other *Zingiberaceous* plants by different tribes in the Philippines.

As near to *Alpinia cumingii K. Schum.* as to any other Philippine species.

Alpinia rosea Elm. n. sp.

Few to several stemmed clusters; stems 6 dm high, terete, dark green, 6 mm thick, ascending, much enlarged at the base; rootstock scale provided. Leaves linearly lanceolate, ascending, nearly flat except the recurved tips, coriaceous, very dark green above, much paler beneath, glabrous, alternating every 3 cm, gradually tapering toward both ends, sharply and slenderly acuminate at the apex, base cuneate or obtuse, curing grayish on both sides, lanceolate, short petioled, 10 to 18 cm long, 2 cm wide; sheaths overlapping, becoming distantly separated from the stem, minutely striate, glabrous, with thin reddish margins; ligule similar in color, also glabrous, 3 mm long, erect, broadly rounded or notched; petiole about 5 mm long, caniculate, glabrous, light brown when dry as is also the midrib beneath. Inflorescent spike terminal, ascendingly curved, 6 cm long, the slender peduncle greenish and glabrous, striate; pedicels whitish, it as well as the angular rachis glabrous, alternatingly scattered, 3 to 4 mm long, unbranched, subtended by a bract vestige; external view of ovary short ellipsoid, glabrous; calyx 7 mm long, 3 mm thick, truncate or obscurely 3-notched, widest across the top, whiter than the pedicels, each of the lobular portions distinctly 3-nerved, all of which connive toward the top and terminate into a mucronate point; corolla tube slender, glabrous, at least 1.5 cm long, expanded toward the lobed portion, pink or roseus; outer 3 lobes spreading, sheathing at the base, 5 to

8 mm long, about 4 mm wide, the upper one larger than the 2 lateral ones, minutely punctate, similarly nerved as the calyx, oblong, rounded at the inwardly folded apex; the pair of inner segments 4 mm long and as broad across the subtruncate lobules, the basal portion clawed, conspicuoosly nerved and punctate; fertile filament 4 mm long, compressed and grooved along the ventral side, fleshy and glabrous, at the base provided with a pair of 2 mm long sterile filaments or staminodes; anther when spread out 2.5 mm wide, 3.5 mm long including the 1 mm long fleshy terminal appendage, connective thick and dark brown on the dry specimens, the ventral 2 cells light yellow and longitudinally dehiscent; style filamentous, bearing an exerted finely hairy subclavate stigma; ovary glabrous, 2 mm long by 0.75 mm thick, cylindric, truncate and minutely lobulate at the apex.

Type specimen number 12509, *A. D. E. Elmer*, Magallanes (Mt. Giting-giting), Sibuyan, May, 1910.

Gathered in moist red clay covered with humus of a densely wooded flat at 4500 feet latitude.

The slender corolla tube at once distinguishes it from *Alpinia flabellata Ridl.* The two inner broadly lobed or merely notched segments seem strange characters to the genus.

Alpinia sibuyanensis Elm. n. sp.

Small tufts; stems several, terete, green, unequal in length, 1 to 2 m high or much shorter, ascending from the bulbose base, declining toward the top, 7 to 12 mm thick. Leaves ascending, coriaceous, shallowly folded upon the upper slightly greener side, with wavy margins, nearly flat, glabrous, slenderly tapering toward the sharply acuminate and strongly recurved apex, base cuneate or obtuse, broadly lanceolate, short petioled, similarly gray on both sides, at least 2 dm long by 4 cm wide across the middle; sheaths clasping and overlapping, densely striate, glabrous, margins subhyaline, separated from the stem toward the top; ligule 3 mm long, broadly rounded or notched, erect, glabrous, red especially on the inner side; petiole scarcely longer, also glabrous, caniculate above, striate below; midrib pronounced beneath and striate. Inflorescence terminal, erect, 7 to 12 cm long including the greenish peduncle, very short branched below the middle; rachis angular and striate, glabrous; pedicels always forked or branched, 5 mm long or less, glabrous in the flowering state, curing black; calyx 6 mm long, 2.25 mm thick, boot-like, glabrous, obscurely 3-lobed; corolla tube 1 cm long, expanded toward the distal end, the whole of the corolla glabrous; outer 3 lobes 7 mm long, nearly 3 mm wide, distinctly punctate, with 3 connivent nerves, oblong, rounded at the infolded apex; the 2 inner segments 4 mm long, 3 mm wide, nerved, bifurcated with subtruncate lobes, constricted for the basal one third; fertile filament 5 mm long, thick, glabrous and grooved upon the upper side, with 2 sterile filaments or staminodes from its base; anther nearly 3 mm long, relatively broad when spread out, connective fleshy, glabrous, nearly black when dry, truncate and slightly emarginate at the apex; cells ventral, light yellow, dehiscent longitudinally; style thread-like, glabrous, bearing a subcapitate nearly glabrous stigma; ovary columnar, glabrous, 2 mm long. Fruit globose, shining green, then lemon yellow, finally scarlet red, less than 1 cm in diameter, the 3 cells divided by a thin whitish partition; mature seeds 5 mm across, grayish brown, convex on the back, grooved along the ventral side and excavated at the basal portion, only 1 seed in each cell.

Type specimen number 12316, *A. D. E. Elmer*, Magallanes (Mt. Giting-giting), Sibuyan, April, 1910.

Found in wet stony ground of woods along the Sinuban creek at 750 feet altitude. The local Visayan called it "Bohonan".

At first I classified it with *Alpinia rosea Elm.* The larger leaves, more punctate floral segments, total lack of an anther appendage, three celled and three seeded fruits and the short branched pedicel branches serve as distinguishing characters.

Alpinia subfusicarpa Elm. n. sp.

Small 2 to 3-stemmed clusters; stems 3 m high or higher, 2.5 cm thick at the base, green, recurved above the middle. Blades alternate, ascending from the base, recurved toward the sharply acuminate tip, deep or rich green though paler beneath, soft in texture, unequally brown in the dry state, margins irregularly wavy and fuzzy brown pubescent, soft pubescent beneath, puberulent on the upper folded surface, base gradually obtuse and occasionally inequilateral, 10 to 15 cm apart, elongated, both the terminal as well as the basal leaves reduced in size, the average of the larger ones 6 dm long and 1 dm wide; midrib conspicuous beneath, curing lighter brown, deeply grooved along the upper side; petiole strict, 3 cm long, caniculate above, pubescent, finely striate as is also the midrib beneath; sheath split or separated especially toward the top, striate, the exposed portion dirty yellowish pubescent, the margin on the inner side purplish brown in the dry specimens; ligule 5 to 8 mm long and rather wider, erect, dirty pubescent on the outside, truncately rounded or split at the apex, purplish on the inner glabrous side. Flowers not seen. Infrutescence mature, 15 cm long, terminal, suberect, ascendingly curved, spicate; peduncle 3 to 5 cm long, 1.25 cm thick, green; rachis finely striate and more or less angular, yellowish brown pubescent; pedicels alternatingly scattered all around, similarly pubescent, usually curved, 1 to 1.5 cm long, scarcely thickened at the distal end; fruit or capsule subfusiform or oblongish ellipsoid, 3.5 to 4.5 cm. long, triangular and gradually tapering toward the base, more rounded toward the broader apex, terminated by the circular calyx scar, pubescent in the young state, glabrous and puberulent when old, dehiscing from the base toward the apex into 3 carpels, 1.5 to 2 cm thick at the middle or just above it, subpendulous, deep brick red in the ripe state; seeds many, irregularly triangular, glomerated in between the thin subhyaline partitions, creased across the outer convex surface, the inner sides plane and angular, 4 mm across.

Type specimen number 10506, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, May, 1909.

This characteristic plant was collected in fertile humus covered soil of deep damp woods at 4000 feet altitude. The Bagobos who eat the fruits call it "Bosadak".

Not *Alpinia haenkei Presl*, *Alpinia copelandii Ridl.* nor *Alpinia illustris Ridl.* Neither is it *Alpinia trachyascus K. Schum.* The petiole of the latter is eight cm long and has a glabrous rachis even in the flowering state.

Amomum propinquum Ridl.

In the herbarium, Bureau of Science, there are nearly a dozen specimens of this species in flower but without leaves or at least authentic leaves. It seems to be widely distributed, since *Dr. Copeland's* number 843 from Davao almost exactly duplicates my flowering number 6284 from Baguio and which *Dr. Ridley* used as the type.

The fruit of this species is about as hard to produce as is that of *Hornstedtia philippinensis Ridl.*, and while we know the leaves of only one of these two species representing two genera, the flowers and inflorescences are quite distinct to the casual observer. The inflorescence of *Amomum propinquum Ridl.* is subglobose, upon a stalk provided with short broad bracts, with whitish yellow flowers whose lobes are broad. The inflorescence of *Hornstedtia philippinensis Ridl.* is much narrower, upon a very short stalk if any, and whose flowers including the lobes are slender and crimson in color.

Amomun mindanaense Elm. n. sp.

Small clumps; stems ascending, recurved toward the top, 1.25 cm thick, terete, green, several, nodulose at the base, 1 to 2 m high, the basal one third leafless. Leaves alternatingly scattered, reduced at both ends, more scattered below, more numerous toward the top, flat, subcoriaceous, very deep shining green above, duller beneath, glabrous, curing greenish gray on both sides, the abrupt caudate tips recurved, attenuate toward the base, sessile, margins wavy and appressed brown hairy, linearly oblanceolate to oblong, 2 to 4 dm long, 4 to 7 cm wide at the middle or above it; sheath overlapping especially at the base of the stem, easily separating from the stem toward the throat, brown when dry, finely striate, glabrous except the long hairy exposed margins; ligule short, rounded, hairy especially along the edges, when old becoming nearly glabrate; midrib deeply channelled above and prominently raised beneath, darker brown when dry and glabrous. Inflorescence arising from the rootstocks, upon a 4 to 7 cm long upwardly curved stalk; peduncle soft hairy, clothed with imbricating bracts; the basal short bracts ovate, the upper or longer ones ovately lanceolate, submembranous, pilose along the margins, otherwise sparsely pubescent, longitudinally ridged in the middle region, the marginal sides thinner, reddish streaked and more or less wrinkled; the outer flower subtending bract nearly 4 cm long, 1.5 cm wide below the middle, glabrous on the inner side, conspicuously veined and minutely punctate, otherwise the same as the upper peduncle bract; head elongated, cylindric, varying from 7 to 15 cm long, nearly 5 cm thick, the young ones much shorter and conical; flower erect, 5 cm long, with an evident bad odor; bracteole 2.5 cm long, the basal one half tubular, the upper portion split, membranous, sparsely hairy, more or less inflated, terminated by small points; calyx tubes 2.25 cm long, similarly pilose; its 3 lobes oblong, hyaline and glabrous, yellowish white, 1.25 cm long; lip yellow in the middle and bordered with purple streaks, also membranous, punctate, 1.5 cm long, obovately oblong, entire or with 2 short and broad lateral lobes; filament very short and broad; anther cells 3 mm long, obliquely truncate at the apex, subparallel, base bluntly pointed, the thin connective extended into a hyaline punctate truncate crest 3.5 mm in length, the cells longitudinally dehiscent and glabrate; style minutely punctate along the sides, expanded toward the punctate or pulverulent funnel-shaped stigma; ovary villous. Young fruit smooth though densely hairy, nearly globose, dirty white, 1 cm in diameter.

Type specimen number 10822, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, June, 1909.

This plant was collected in damp deeply humus covered ground of the oak forests at 3750 feet altitude south of the Baruring river. "Tanaulak" in Bagobo.

Allied to *Amomum palawanense Elm.* and apparently distinct from *Amomum deuteramomum K. Schum.*

Amomum muricarpum Elm. n. sp.

Clumps; stems several, ascending, ultimately reclining, terete, 1.75 cm thick at the base, green, glabrous, 3 to 5 m long, the basal portion bulbose and red. Leaflets subsessile, many, every 7 cm alternating, widely scattering and much reduced toward the base, smaller and more numerous toward the apex, coriaceous, only slightly folded on the upper deep green surface, gradually tapering to the acuminate to subcaudate recurved apex, base obtuse, linearly lanceolate, 2 dm long by 7 cm wide below the middle, unequally brown when dry, glabrous; sheaths glabrous except the minutely ciliate margins toward the throat, gradually separated toward the top, the overlapped portion more strongly striate; ligule 3 mm long, very broadly rounded or subtruncate at the apex, glabrous except the margins; midrib yellowish green, entirely glabrous, lighter brown when dry, grooved on the upper side especially toward the base. Inflorescence upon reddish suberect 1 dm long bracteate slightly pubescent stalks arising from the rootstock; bracts imbricate, the basal ones ovate and 1 cm in length, the upper ones two to three times as long and acute to acuminate, all striate and sparsely pubescent or glabrate, when old chartaceous; bracts subtending the flowers reddish tipped, 2.5 cm long, submembranous, truncately rounded at the apex, oblong though usually wider above the middle, punctate, strigose on the back especially toward the distal end; bracteole 1.25 cm long, boot-like, divided at the apex into 2 or 3 obtuse segments, pubescent, also submembranous, tips reddish tinged; calyx nearly 4 cm long, the tube glabrous though distinctly reddish brown punctate, terminating into 3 acute points; corolla tube as long as the calyx, the lobes at least 2 cm long, yellowish, oblong, rounded at the apex, glabrous, obscurely punctate; the lip more erect and thicker in texture, considerably longer, white and with a bright yellow in the center and streaked from the base with purple spots, broadly obovate and ventrally folded, the broad apical margin occasionally irregularly cut, numerously veined in the middle region; fertile filament 7.5 mm long, tick, glabrous, punctate; staminodes minutely apiculate; anther nearly 1 cm long, the connective submembranously crested and with conspicuous lateral wings, all densely punctate, only the linear longitudinally dehiscent cells pubescent; ovary 1 cm long, constricted toward the base, the upper shallowly rugose portion glabrate. Pedicels of fruits 1 to 1.5 cm long, bracteate near the base, sparsely pilose; fruit 2.5 cm long, 1.5 cm thick, subtruncate at both ends, deep purplish red, curing black, ellipsoid, somewhat constricted toward the rugosely crested apex, densely covered with muricate appendages or spines except at the base, apparently 3-celled, each cell containing numerous irregular blackish brown seeds.

Type specimen number 10947, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, June, 1909.

Gathered in wet gravelly soil of woods on steep slopes along the Baracatan creek at 1750 feet altitude. "Panicaban" in Bagobo.

The smaller more elongated inflorescence with different flowers and peduncle bracts at once distinguish our plant from *Amomum propinquum Ridl.* To be compared with my number 7664 from Lucban and which was distributed under *Hornstedtia philippinensis Ridl.*

Amomum palawanense Elm. n. sp.

Dense clusters or tussocks; rootstocks dirty yellowish brown, terete, 1.25 cm thick, covered with sheaths; stems numerous, as thick as the rootstock, 1.75 m high, the basal two thirds leafless and covered with dry brown sheaths. Leaves alternate, 7 to 12 cm apart, ascending, coriaceous, dark dull green on the strongly folded upper side, somewhat paler beneath, drying grayish green, glabrous except the minutely ciliate brown edge which is rugose especially toward the twisted and recurved setaceously acuminate to caudate tip, base cuneate or subattenuate, sessile, linearly oblong, 2 to 3 dm long, 4 to 5 cm wide at the middle or above it, the basal ones much smaller and different in shape; sheath more prominently striate on the exposed side, the margins toward the separated throat long hairy; ligule very short or only decurrent along the upper portion of the sheath; the decurrent petiole raised beneath and deeply sunken above, light brown when dry, the midrib very much the same. Inflorescence upon short bracteate branchlets arising from the rhizome, barely above ground; cones elongated, 5 cm long or shorter; peduncle somewhat shorter, curved, terete, striate, brown when dry and nearly glabrous when old; bracts densely imbricate, short and broad, broadly rounded at the apex, striate, the older ones subglabrate and turning brown, persistent; the upper and floral bracts stramineus, relatively membranous, oblong or oblong lanceolate, 2 to 2.5 cm long, sunken along the longitudinal veins, tips usually acute, long hairy along the edges and pubescent on the back, prominently veined and reticulated on the inside; bracteole nearly 2 cm long, clasping at the base, open along the upper side, obtusely pointed or notched, slightly hairy; the bracteole enfolding the calyx, longer and distinctly 3-toothed at the apex, otherwise tubularly inflated, stramineus, membranous and more or less hairy; calyx tube 2 cm long, appressed pilose; its 3 lobes oblong, subequal, 1 cm long, rounded at the apex, subhyaline, glabrous, cremeus; lip white except the deep yellow middle portion and the thickened rugose margins which are purplish lined, obovately oblong, 1.5 cm long, glabrous, edges inwardly folded; fertile filament 5 mm long, broad and glabrous; anther 4 mm long and fully as wide across the top, the punctate and yellowish connective broad and terminating into an unequal 3-lobulate crest; cells divergent from the base, glabrous as is also the crested connective, pointed at the base, dehiscent on the ventral side below the middle; ovary pilose. Fruits yellowish gray, triangularly globose, broadly rounded at both ends, terminated at the apex by the short calyx remnant, longitudinally striate, appressed pilose, containing several triquetrous blackish brown seeds covered with a grayish membrane.

Type specimen number 12795, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, March, 1911.

Found in good soil among open thickets of woods along a creek bottom at 250 feet altitude.

Apparently related to *Amomum loheri K. Schum.*

Amomum pandanicarpum Elm. n. sp.

Scattering tussocks; stems with a large bulb at the base, the basal one third leafless, 4 cm thick, erect and rigid, 5 to 7 m high, somewhat reclining toward the top, glabrous. Leaves ascending from the base, otherwise recurved, the larger ones 1 m long, 12 to 15 cm wide, short petioled, conduplicate on the upper deeper green surface, curing unequally brown on the upper and lower sides, rigidly coriaceous, sides coarsely wavy and becoming lacerated, the edges rugose and usually minutely ciliate, the nether yellowish pale green side spotted with small lighter brown blisters, apex acute or acuminate, base broadly cuneate, oblong, broadest across the middle or below it, the leaflets reduced and scattering toward the base, alternating, 10 to 18 cm apart, stoutly petioled; sheath tightly clasping the stem though becoming separated toward the throat, striate, the overlapped portion glabrous, puberulent towards the ligule; ligule decurrent, the erect free portion 1 to 1.5 cm long, oblong and obtusely rounded at the apex, yellowish gray pubescent along the margins and toward the apex on the outside, thick and striate, the inner side smooth, glabrous and purplish; petiole 2 to 3 cm long, deeply channelled above, the basal one half of the channel covered with a pubescent thin caducous membrane, the dorsal side rounded, smooth and glabrous; midrib very conspicuously raised beneath and grooved along the upper side. Infrutescence arising from the rootstocks, barely above ground, 8 to 14 cm long; peduncle at least one half as long, provided with imbricating bracts, pubescent in the younger state; bracts 2 to 3 cm long, those subtending the fruits 5 cm long, lanceolate or oblongish, chartaceous, soft yellowish pubescent but becoming glabrate toward the striate apical portion; heads subglobose, hard, 7 to 12 cm in diameter; fruits angularly obovoid, 3 cm long, at least 2 cm thick above the middle, obscurely ridged toward the irregularly rugose apical rim, in the dry state short yellowish canescent, surrounded by linear persistent bracts exceeding them, sessile or nearly so, the pericarps tough and deep purple on the inside, apparently 3-celled;

seeds numerous, triquetrous, 3 mm in diameter, blackish brown, conglomerated.

Type specimen number 10508, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, May and September respectively, 1909.

This type number was discovered in rich soil of a steep open glen among monstrous wild "abaca" or Manila hemp plants at 3500 feet altitude. The native name is "Dalikan" and the Bagobos eat the seeds. The fruits are very similar to the syncarps of certain species of ***Pandanus***.

Having lost the collected flowers I quote from my field label. "Flowers all erect and curved, odorless, 5 to 8 cm long, subtended by a whitish rather loose bract; calyx and the calyx sheath reddish, soft; corolla lemon yellow, the inner and lateral segments erect, the outer one deeper yellow, rigid and recurved; staminode bent over the outer petal, yellowish white except the dark crimson apex."

My number 11759 distributed under the above new name is a much smaller plant and may be the fruiting specimen of *Hornstedtia dalican Elm.* which in turn may more properly belong to the genus *Amomum*. There remains also the possibility of *Amomum pandanicarpum Elm.* belonging to the genus *Hornstedtia*.

Amomum pubimarginatum Elm. n. sp.

Tufted perennials; stems 3 or more, ascending, 1 to 2 m long, 1.5 cm thick at least, green, scarcely thickened at the base; young rootstock red bracteate. Blades very smooth on both sides, deeper or darker green above, ascending except the recurved apical portion, upper side duller brown when dry, flat, alternate, the basal ones reduced and scattering, glabrous or nearly so above, lighter green beneath and likewise glabrous, the corrugated edges densely fuzzy brown hairy, base obtuse, distinctly petioled, apex also obtuse though abruptly terminated by a setaceous much recurved point, oblong, 2.5 to 3.5 dm long, 7 to 10 cm wide across the middle; petiole relatively slender, 1 to 2.5 cm long, caniculate, short and yellowish pubescent; midrib raised beneath, channelled above, puberulent in the young state;

sheath finely striate, easily separating from the stem, dirty puberulent, the thinner edges without hairs; ligule ovately elongated, stiff, erect, 5 to 8 mm long, usually entire and broadly rounded, densely yellowish pubescent on the back. Inflorescence upon slender reddish stalks arising from the horizontal rootstocks, spicate or occasionally branched; the head triangularly elongated, 3 to 7 cm long, obovoid in outline; peduncle somewhat shorter, appressed pubescent. ultimately glabrous, imbricately provided with bracts; basal bracts short and broadly ovate, increasingly becoming enlarged toward the head, the upper ones 2.5 cm long by 1 cm wide at the clasping base and acuminate at the apex, prominently striate, when old chartaceous and glabrate; outer flowering bracts similar, erect, broadly lanceolate, with sharply acuminate points, the sides inwardly folded, sparsely hairy toward the base even in the fruiting state; inner flowering bract 2 cm long, glabrous, the upper one third 2 to 3-lobed, the reddish ones sharply pointed and inwardly folded; calyx a trifle longer, the upper one third 3-toothed, the teeth similarly colored as the bract lobes, pubescent on their backs and along the acuminate points; corolla tube slender and a trifle longer than the calyx, puberulent; the lobes oblong, submembranous, yellow below the middle, otherwise reddish, the lateral ones shorter and narrower, the upper one longest and 1.5 cm in length; lip 6 mm long, folded over the stamen, apparently dark red, minutely punctate, ovately elongated, truncately rounded at the apex, glabrous as are the regular corolla lobes; fertile filament very short though broad; anther 3 mm long; cells divergent toward the apex which is notched and crestless, long hairy, ventrally dehiscent, dull yellow; style slender and glabrate, thickened toward the oblique and much enlarged stigma; cylindric ovary more or less short hairy. Fruits subglobose, 1.25 cm in diameter, reddish brown, very short pedicelled, well protected by the persistent bracts, densely covered with a shining yellowish appressed pubescence, bearing the persistent calyx, both ends truncately rounded and usually provided with short blunt excrescences, otherwise smooth; seeds several in each of the 3 cells, triquetrous, black and somewhat grayish covered, 2.5 mm across.

Type specimen number 10546, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, May, 1909.

Gathered from well drained soil of dense woods at 4250 feet altitude south of the Sibulan river. The natives or Bagobos called it "Tabak-bukalod" and its seeds are eaten by them. It is neither of the allied species, *Amomum warburgii K. Schum.* nor *Amomum lepicarpum Ridl.*

Globba aurea Elm. n. sp.

Small tufts; stems few, erect, 3 to 6 dm high, densely purplish spotted. Leaves ascending, membranous, much paler green beneath even in the dry state, on an average alternating every 3 cm, lanceolately oblong, at most 2.5 cm wide across the middle or a trifle below it, the lower ones much reduced and even bract-like, 12 cm long, gradually acuminate at the apex, base gradually obtuse, glabrous on both sides or the sunken midvein minutely puberulent, the prominent midrib beneath curing duller brown; sheaths well separated, finely striate, margins toward the throat ciliate, the exposed portion purplish spotted or colored, glabrate; ligule auriculately lobed, 2 mm long, ciliate around the subhyaline edges; petiole about as long, relatively wide, puberulent beneath, grooved on the upper side. Spike or spike-like inflorescence terminal, erect, 16 cm long or shorter; peduncle one half as long, very slender, green, glabrous; rachis fluted, also green and glabrous; pedicels similar, divaricate, 5 mm long, usually 2-flowered, subtended by a 3 mm long oblong yellowish deciduous bract; calyx 4 mm long, yellowish, glabrous, cylindric, 2 mm thick across the 3-lobed and mucronulated apex; corolla deep yellow in bud and in anthesis, the curved part 1 cm long; segments 6 mm long, subequal, oblongish, yellow and hyaline, the lower one almost divided, the lateral ones divaricate, the upper one straight, thicker in texture, ventrally folded, truncate at the apex; the central petaloid portion or staminode exceeding the segments, subemarginate at the apex, with a large downwardly curved spur; ribbon-like filament nearly 1.5 cm long, hyaline, glabrous; anther 2 mm long, almost as broad across the middle, basifixed, each cell acute at the base and well separated, subtruncate at the apex, provided with a single divaricate hyaline spur 2 mm long; the very slender style bearing a minute stigma appearing as a fine hyaline point beyond the anther which is dark yellow. Young fruit angular and rigid.

Type specimen number 13243, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, May, 1911.

Gathered from wet rock crevices upon ledges along the Iwahig river at about 1000 feet altitude. Rare in our locality.

Not at all *Globba ustulata Gagnep.* Apparently most closely related to our Philippine *Globba brevifolia K. Schum.* and *Globba gracilis* of the same author.

Hedychium philippinense K. Schum.

Field-note:—Epiphytic herbs, 2 to 3 feet long, with 1 to 3-clustered stems, mostly upon humus beds in the lower forks of trees in woods at 2500 feet; leaves submembranous, paler beneath, when old and dry the edges well curved under, the terminal ones largest; infrutescence from 1 to 5 capsules, upon a very short terminal stalk; capsule 1.5 inch long, 3-sided, orange yellow when mature, dehiscing from the apex nearly to the base; the carpels thick, recurved, persistent, darker red on the inner surface and splitting off from the central placenta portion; seeds dark red, subtended by a succulent similarly colored fibrillose aril; receptacle or rather the placenta erect. The open capsule with its seeds appears like a conspicuously red colored flower.

Represented by number 7909, *Elmer*, Lucban (Mt. Banahao), Luzon, May, 1907.

Besides the type from the Jolo islands, *August Loher* collected it in flower at Montalban in 1905. In the herbarium, Bureau of Science, are a half dozen of fruiting specimens more recently collected from southern Luzon and from the Visayan region. On some of these field labels the flowers are described as red though the specimens are only in fruit. *Mr. Loher* nor *Dr. Schumann* did not describe the color of the flower, yet *Dr. Ridley* uses that character in his key to separate it from the common introduced pure white terrestrial species, *Hedychium coronarium Koenig.* There is some doubt in my mind whether the Luzon plant is the same as *Dr. Schumann's* species, though the characters of the fruit of the Luzon plant has been more recently incorporated with the description of the plant from Jolo.

Hedychium mindanaense Elm. n. sp.

Few stemmed epiphytic clusters; stems 1 to 2 m high or long, descendingly spreading, flattened, the basal one third leafless, provided with sheaths. Leaves also descending, 6 to 12 cm apart, flat, submembranous, dull green above, much lighter beneath, curing brown, glabrous, margins quite straight, alternate, linearly oblong, the lower ones smaller, 2 to 6 dm long, 5 to 9 cm wide across the middle, sharply acute to acuminate at the apex, sessile, gradually narrowed toward the base, midrib conspicuous beneath especially toward the stem; sheath also glabrous, separated toward the throat, erect, membranous, similarly brown in the dry state, 5 to 8 cm long, 2 cm wide, oblong and rounded at the apex, the sides decurrent down the sheath margins, glabrous. Inflorescence terminal, erect, 15 cm long, 4 cm thick, subterete, formed of rather soft dark green imbricated bracts; basal bracts ovately oblong, acute at the apex, broad and clasping at the base, 7.5 cm long, 3 cm wide below the middle, dull brown when dry, glabrous except the puberulent apex. Flowers 2 from the axils of the bracts, odorless, of unequal age or developement, the one in full anthesis 12 to 18 cm long; floral bract 3 to 5 cm long, broad and boot-like toward the base, thinner in texture, gradually tapering to the obtuse usually pubescent apex, open along the upper ventral side, oblong, similar in color on the dry specimens; calyx green, slender, tubular, 8 cm long, the upper somewhat thickened portion open along the ventral side, apex rounded and finely pubescent, otherwise glabrous; corolla twice as long, the slender tube yellowish; the outer 3 lobes imbricately twisted, greenish, glabrous, linear, rotately spreading, ultimately becoming deflexed, 3 to 4 cm long; the inner 3 lobes shorter and broader, the lateral pair clawed at the base, conduplicate on the upper side and with wavy or crinkled margins, the lamina portion lance shaped, cremeus, ultimately recurved except the middle suberect one which is broader and deeply forked singly or doubly from the apex, all glabrous; exerted filament about as long as the corolla segments, glabrous, yellowish red, recurved; anther horse-shoe shaped, 1.5 cm long, linear, attached below the middle, basal portion caudately lobed, obliquely truncate at the apex, linear; the hairy capitate stigma barely exerted above the anther; style extending through the tubular filament and between the anther cells. Fruit not known.

Type specimen number 10673, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, May, 1909.

Discovered upon a partly decayed snag ten feet above ground of an open steep slope at 3500 feet altitude. The Bagobo name is "Calawag".

Leaves and flower too large for *Hedychium philippinense K. Schum.*

Hornstedtia philippinensis Ridl.

Field note:—Scattering herbs, usually forming patches along the border line of meadows and thickets or light woods at 2250 feet; stems rigid, hard, green, smooth, 1 inch thick, about 3 to 9 feet high, leaf bearing from below the middle; leaves ascending, the lowermost scattering and much reduced, smooth, darker green above, strongly conduplicate on the upper side, easily breaking; inflorescence upon a 1 to 5 inches long flattened usually curved bracteate peduncle arising from the rootstock some few feet from the base of the stems; flowers barely above ground, spreading, bright cardinal red, the calyx pink, stigmatic head very dark red.

Represented by number 9280, *Elmer*, Lucban (Mt. Banahao), Luzon, May, 1907.

Although common in middle elevations throughout our archipelago and has repeatedly been collected with leaves and flower, its fruits are till now unknown. The slender sub erect and crimson red flower is of short duration and only one or two are in anthesis at the same time. Underground rhizomes long and horizontally ramifying, the inflorescence frequently appears considerable distance from the leafy stems.

Hornstedtia dalican Elm. n. sp.

Spreading clumps; stems ascending, 2.5 cm thick, with a thick bulb at the base, terete, hard, green or reddish toward the base. Leaflets alternate, 8 cm apart toward the top, scattering and much reduced toward the base, the basal one third leafless, ascending and finally recurved, conduplicate on the upper dull green surface, much lighter green beneath and finely puberulent, glabrous except the irregularly wavy yellowish gray pubescent margins, apex obtuse though with an abrupt acuminate point, base broadly cuneate or obtuse, the larger blades 8 dm long by 12 cm wide, oblong, curing similarly brown on both sides; sheaths rigid, deep brown when dry, glabrous except the exposed portion, striate, margins thin, separated especially toward the top; ligule oblong, 1 cm long, decurrently extending along the sheath margin, densely yellowish hairy; petiole 1.5 cm long, stout, densely pubescent along the caniculate margins, glabrous beneath; midrib also glabrous, sunken above, pronounced beneath and deeper brown when dry. Inflorescence arising from the rhizome, cone-like, 5 to 8 cm long, one half as thick; odorless flowers erect and forming a truncate top when in full bloom; peduncle 4 to 9 cm long, canescent, provided with ovate to oblong imbricating bracts; bracts persistent and brown, the basal ones short, the upper ones 4 cm long, minutely striate and sparsely canescent on the outside, apex subtruncate and deeply notched or obscurely toothed; the flower subtending bracts linear, 3 cm long, submembranous, nearly glabrous, longitudinally nerved, broadest across the 5 to 7 mm wide irregularly toothed subtruncate apex; bracteoles 5 mm shorter, somewhat compressed, the basal two thirds tubular, the upper portion divided into 2 or 3 lobes with pubescent apiculate points, longitudinally nerved, tips usually red, otherwise whitish as are also the bracts; calyx 3.5 cm long, tubular except the 3-toothed top which is slit open along one side for the protrusion of the curved corolla, puberulent on the exterior exposed portion, similar in texture and color to the bracteole; corolla at least 4 cm long, the basal two thirds tubular, the upper portion apparently divided into 3 oblanceolate segments, whitish toward the base, otherwise bright yellow even so in the bud state, glabrous, delicate; lip erect, much thicker in texture, constricted at the base and attached to the broad filament, yellowish and with a brighter yellow fringe, 1.5 cm long, ovately triangular, margins inwardly folded and rugose. conspicuously nerved; filament broad, 5 or more mm long; anther 7.5 mm long, broad, apex with a 0.75 mm long truncate crest, the ventrally dehiscent cells terminating into short blunt points at the base, creamy yellow; style slender, glabrous, expanded toward the elongated button shaped glabrous stigma, both whitish in color.

Type specimen numbers 11626 and 11759, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, September, 1909.

Collected in fertile moist soil in open glens near springs or streamlets among the forests at 3500 feet altitude. Both numbers were called by the Bagobos "Dalican." The latter number cited does not agree in every detail with the above description.

Leptosolena insignis Ridl.

This showy snow white flowered *Zingiberaceous* plant has since my discovery been collected several times, but only from the northern type region. In its native subalpine region it thrives in rocky rather open places and it has been successfully transplanted to Los Baños by the College of Agriculture where I have seen it in beautiful flower.

Phaeomeria imperialis Lindl.

Field note:—Dense tussocks 5 to 12 feet across, in moist or wet fertile soil of damp shaded places or pockets on benches along the Sibulan river at 3000 feet; mature stems at least 20 feet long, recurved above the middle, smooth and green, 3 inches thick toward the base and with a 5 inches thick bulb at the base, tightly covered with imbricating bracts every foot or so; leaves many, alternating every 6 inches, more scattering and reduced to mere bracts toward the base, the basal 5 feet of the stem leafless, shining dark green above, much paler beneath, ascending and recurved, strongly conduplicate especially the apical ones; margins with a fine brown streak, irregularly wavy; midrib yellowish green; inflorescence upon dark green bracteate 1 inch thick terete and erect peduncles arising from the horizontally branched rootstocks and from the side of the bulbous stems, averaging 3 to 5 feet high; heads ovoid, 3 to 5 inches long, quite solid; the basal bracts the largest, in the bud state strongly imbricate, of a pleasing red or pink with slightly whitish margins, in anthesis becoming recurved, twisted and ultimately deflexed, leathery and whitish toward the base, shining on the upper side; flowers ascending, nearly straight, about 2 inches long; the thin imbricated bracts bright red; corolla very oblique at the throat, the basal two thirds soft and white, the apical portion of a smooth rigid shining dark red with bright yellow margins; filament white, adnate to the corolla; ovary yellowish, style pink except the wine colored stigma; anther strongly recurved over the corolla, creamy yellow beneath, pink above; fruiting heads elongated, 6 inches long, 3 inches thick; carpels smooth, 1 inch long, pink, obovoid; seeds nearly black. The Bagobos call it "Tawake''.

Represented by number 10552, *Elmer*, Todaya (Mt. Apo), Mindanao, May, 1909.

To me it did not appear as an introduced plant and I saw only one clump. *Mr. R. S. Williams* also collected it in the Davao Gulf region, otherwise not known from the Philippines. It does not answer well the description in Pflanzenreich, yet *Dr. Ridley* considers it only a rank form. The long stalks bearing the pleasing red imbricated heads whose basal bracts become reflexed remind one of the "Lotus'' flower or *Nelumbium speciosum Willd.* Its introduction into the Manila gardens would be greatly appreciated.

Plagiostachys corrugata Elm. n. sp.

Tufted perennials; stem 2 or 3, green, rather soft in texture, 1 m long, 1.25 cm thick towards the yellowish base, arising from flattened rootstocks. Leaves about 5 or fewer, the basal ones much reduced and ovate, ascending and then recurved, submembranous, lighter green on the finely soft pubescent nether side, slenderly petioled, tips rather abruptly though setaceously acuminate, base obtuse and slightly inequilateral; blades 2 to 3 dm long, 5 to 6 cm wide, elongated, drying similarly brown on both sides, nearly flat, the margins appressed yellowish pubescent, glabrous on the upper surface; sheaths becoming well separated from the stems, minutely striate and blackish brown puberulent or pulverulent, the thin edges scarcely ciliate except toward the throat, overlapping; ligule oblong, either acute or obtusely rounded at the apex, coarsely blackish pulverulent or pubescent along the edges, up to 8 mm long, decurrent along the sheath, glabrous and purplish red on the inner side; petiole varying from 2 to 4 cm long, the basal foliaceous blades subsessile, striate beneath, deeply and narrowly caniculate above, more or less hairy; midrib prominent beneath and lighter brown when dry, caniculate above, puberulent. Flowers not seen. Infrutescence upon a 5 cm long stalk arising from the basal portion of the stem; peduncle suberect or curved, 1.25 cm thick with the bracts, glabrous; basal bracts ovate, the upper ones 2 cm long and oblong, imbricatingly clasping, chartaceous, glabrous, with numerous longitudinal nerves, apex rounded or subtruncate; pedicels divaricate, 1 cm long, rigid, glabrate or puberulent, subcompressed, at the base subtended by minute bract vestiges; fruit hard, reddish, ascendingly crowded or curved, 2 cm long, almost 1 cm thick toward the base, ovoidly elongated, truncate at the base, gradually tapering to the apex which still bears the lacerated floral parts, conspicuously corrugated longitudinally and carinated in between the 7 to 9 prominent corrugated and irregularly toothed wings, glabrate when old though apparently somewhat hairy in the earlier state, 3-celled; seeds several in each cell, conglomerated and attached to the central portion of the intercepting thin partitions, irregularly round, 2 mm across, bright yellow.

Type specimen number 11130, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, July, 1909.

Found in very moist humus covered fertile soil bearing a mixture of hardwood and bamboo forests at 1500 feet altitude. "Cimaroon" is the native or Bagobo name. Under this number were collected several sterile specimens whose blades are thinner, more glabrous and whose bases are cuneate rather than obtuse; the ligule also is thinner, almost glabrous and much longer. They may only represent young stems of the same species, though their characters are not included in the above diagnosis.

Plagiostachys escritorii Elm. n. sp.

Rather dense but small clusters; stems quite straight, varying from 1 to 2 m long, suberect or reclining, at least 1.5 cm thick at the base and only slightly bulbose, green. Leaves thin, soft, ascending, finally recurved, the young ones yellowish red, the edges somewhat wavy and short pubescent as is also the nether side, dark green on the upper glabrous surface, paler beneath, curing dull brown on both surfaces, the sides coarsely corrugated in appearance, conduplicate toward the base, more scattering and reduced toward the base, oblong or oblanceolate in outline, alternate, the average of the larger blades 6 dm long by 9 to 13 cm wide above the middle, acuminate at the apex, alternate to cuneate and frequently inequilateral toward the base; midrib very stout beneath and hairy along its sides, deeply grooved along the upper side; sheath with reddish margins, striate and dirty pubescent on the outside, split; ligule 5 to 8 mm long, rigid, similarly pubescent, apex rounded or irregularly so, decurrent down the sheath margins. Inflorescence conically elongated, varying from 7 to 15 cm long, solitary or with few short branches from near the base, arising from the basal portion of the stem and from underneath the humus, ascendingly curved; peduncle short, subtended by a foliaceous bract, angular, yellowish tomentose; rachis angular and likewise tomentose; pedicel 5 to 8 mm long, pubescent, compressed; the subtending bract 1.5 cm long, oblong, soft pubescent on the outside, nearly 1 cm wide above the middle, apex irregularly lacerated, russet brown and becoming shredded with age, when young entire and conspicuously pointed, 3 to 5-nerved; bracteole 1.33 cm long, boot-like, also membranous and pubescent on the exterior, the upper one fourth divided into 2 lobes, longitudinally veined; calyx 1.75 cm long, tubular and subcompressed toward the base, puberulent; the 3 lobes oblong, 7.5 mm long, longitudinally nerved, pubescent on the outside, the apical margins incurved and reddish tinged; corolla as long as the calyx if not longer, dull or deep red, the tubular portion adnate to the calyx tube; lip erect, rigid, glabrous, broadly rounded or lobulate toward the apex, the longitudinal veins of a deeper red, eventually folded; filament short, broad; anther 5 mm long, curved; cells well separated, yellow, pubescent, ventrally and longitudinally dehiscent, terminated by a short truncate crest; the 2 staminodes slenderly pointed; style slender, strigose, terminating with a compressed broadly emarginate stigma. Fruit upon 1 cm long stalks, ascendingly crowded and maturing from the base toward the apex, thereby giving the infrutescence an ovoid or ovoidly elongated shape, 2 cm long excluding the persistent portion of the flower, 1.25 cm thick below the middle, light red, somewhat irregular in shape, hairy in the younger state, strongly carinate when dry, 3-celled, with few irregular blackish seeds in each cell.

Type specimen numbers 10516 and 10544, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, May, 1909.

Both numbers were collected in damp fertile ground of deep or dense forests in the vicinity of the Mainit creek and Sibulan river junction at about 4250 feet altitude. The later number the Bagobos called "Bosadak".

A very distinct species and apparently the same as those collected near Butuan, Mindanao by *L. Escritor* after whom it is here named.

Plagiostachys ridleyi Elm. n. sp.

Dense tufts; roots horizontal, branched; stem terete, 1.25 cm thick or thicker at the swollen base, quite thin toward the much reclining top, green, varying from 1 to over 2 m long, the lower portion leafless. Leaves alternate, thinly coriaceous, conduplicate and erect from the base, the tops gracefully recurved, the abruptly recurved tips setaceously acuminate to a 3 cm long caudate point, attenuate toward the base, glabrous, when dry greenish gray above, fumosus beneath, alternate, the basal ones short and broad, the uppermost ones not shorter than the normal blades but narrower, oblongish or oblanceolately elongated, 6 to 9 cm wide above the middle, the longer ones 7 dm in length, margins glabrous but minutely crinkled; midrib pronounced beneath, deeply channelled above, glabrate, curing lighter straw brown beneath; petiole similar, 2 to 3 cm long; sheaths striate, puberulent, the thin edges purple especially along the inner side; ligule oblong, 1 cm long, short dirty pubescent, tips obtusely rounded, somewhat decurrent down the ligule. Inflorescence lateral, 2 dm above the base of the stems, ascendingly curved, spicate or few branched, 10 to 15 cm long, rigid; peduncle short pubescent, subtended by the dry sheath which is similarly pubescent; branches alternate, also subtended by large sheath-like bracts; flowering spike dense, terete, 2 cm thick, the flowers gradually developing from the base toward the apex; rachis after anthesis almost 1 cm thick, yellowish pubescent, with numerous persistent short and similarly pubescent flowering or fruiting stalks; bracts dirty brown, watery and caducous, of diverse sizes, closely set and imbricate, the longer ones 1.25 cm in length and setaceously acuminate, all more or less lanose; calyx yellowish white, sparsely pubescent, 1 cm long, divided nearly to the middle into 3 acute lobes, membranous; corolla 1.5 cm long, more than one half tubular, glabrous, deep purple; the 2 lateral lobes reflexed, oblong, with entire margins; the upper lobe broadly obovate and margins irregularly cut or lacerated, white, with a yellowish blotch in the center toward the base and with light purple lateral streaks; filament few mm long, thick, glabrous; anther 3.5 mm long, bearing a short truncate crest at the top; style very filiform, glabrous; stigma small, disk-like, minutely ciliate around the edges. Fruits subglobose, 1 cm long, glabrous, obscurely lobed toward the persistent calyx stub, with several irregular nearly black seeds packed between the hyaline partitions.

Type specimen number 12209, *A. D. E. Elmer*, Magallanes (Mt. Giting-giting), Sibuyan, April, 1910.

Discovered in red humus covered clay of a steep wooded incline along a streamlet at 1000 feet altitude.

Leaves entirely too large to be classed with *Plagiosta-*

chys philippinensis Ridl. Dedicated to *Dr. H. N. Ridley* who has published a number of papers on Philippine material of this difficult group of plants.

Vanoverberghia sepulchrei Merr.

Field-note:—Tall herbs with smooth green stems, usually in densely shaded slopes of fertile soil in thickets of the limestone basins at 2500 feet; stems usually or always recurved, as long as 18 feet, bulbose at the base, forming loose clusters; leaves in distichous rows, alternating, 2 to 3 feet long, paler green beneath; infrutescence terminal, pendulous, 8 inches long, upon a dark reddish brown 8 inches long peduncle; capsule erect or ascending, yellowish green, very smooth; peduncle subtended by 3 bracts, the basal one the larger and more or less sheathing; "Barapat" in the Igorot dialect.

Represented by number 8560, *Elmer*, Baguio, Luzon, March, 1907.

Its monstrous size and flagellate leaf tips puzzled me when it was collected. Besides *Father Vanoverbergh's* specimens it has since been collected near Baguio by *H. Sandkuhl* and by *R. C. McGregor* on mount Polis. It must be a beautiful plant, both in flower and in ripe fruit which is reported as varying from pink to dark wine red.

Vanoverberghia diversifolium Elm. n. sp.

Loosely tufted perennial herbs; stems slender, somewhat drooping, 1 to 2 m high, smooth, quite hard, at most as thick as a little finger. Leaves alternating, ascending, diverse in size, glabrous throughout except the abruptly and sharply acuminate tips which are slightly yellowish pubescent, the largest ones in the middle of the leaf bearing stem, scattering and becoming bract-like toward the base, those on the younger stems and toward the apex more numerous and gradually reduced in size, lighter green beneath, curing brown on both sides, sessile or nearly so, flat, the larger blades 2 cm long by 5 cm wide across the middle, oblong, obtuse at the base, the terminal ones linear or lanceolate, 1.25 cm wide and 8 cm long, the average ones 3 cm apart; sheath overlapping, well separated especially toward the top, margins subglabrate, striate especially toward the throat, glabrous, yellowish brown when dry; ligule entire, rounded, 3 mm long and as wide in the larger ones, short and densely pubescent. Flowers not known. Infrutescence 1 dm long, terminal; peduncle green, 3 to 5 cm long, subtended by a single marcescent sheath; rachis of the spike puberulent, ascendingly curved; pedicels cinereous or short grayish lanose pubescent, 5 to 8 mm long, solitary, usually curved, alternating, at the base surrounded by thin brown bract vestiges; fruits 1 to 1.5 cm across, ellipsoid or subglobose, divaricate, slightly pubescent when young, ultimately glabrate or puberulent with faint longitudinal costae, bearing the blunt vestige of the calyx; carpels dry, tardily dehiscing from the apex into 3 divisions; cells 3, with thin whitish partitions; ovules numerous, conglomerated and attached to the central portion of the partitions; seeds irregular and with lighter brown edges.

Type specimen number 8853, *A. D. E. Elmer*, Baguio, Province of Benguet, Luzon, March, 1907.

Quite common in very damp and deeply shaded ravines near the barrio of Sablan. The Igorot called it "Kagda-opot" and the bulbose base of the stem is eaten by the same natives.

The fruiting character is almost exactly that of *Vanoverberghia* rather than that of an *Alpinia*.

Zingiber apoense Elm. n. sp.

Small or few stemmed clusters; stems about 3, swollen at the rhizome, ascending and recurved toward the top, the basal one third leafless, 1 to 1.5 m high, imbricately sheathed toward the base, 1 cm thick. Leaflets also recurved, thinly coriaceous, dull green above, paler beneath, curing unequally brown on the 2 sides, alternate, flat, the basal ones becoming bract-like, glabrous, smooth on both sides, linear to lanceolate, sessile, 4 cm apart, gradually tapering to the slenderly acuminate point, cuneate toward and obtusely terminating at the base, 2 to 3 dm long by 3 to 4 cm wide at the middle; sheath in the early state sparsely strigose, ultimately glabrate, well separated from the stem toward the throat; ligule submembranous, 5 mm long or longer and more pointed or shorter and obtusely rounded, finely pubescent and ciliate but ultimately glabrate, continuous with the sheath margins; midrib pronounced beneath, channelled above, stout at the base. Heads upon a bracteate elongated stalk arising from the root crown, erect, watery, ellipsoid, 7 cm long, 4 cm thick; peduncle 3 to 5 dm long, straight and erect, 1.25 cm thick, hard, terete, glabrous, yellowish green; the alternating and imbricating bracts of the same color, 3 to 5 cm long, oblong, the obtuse apex curved from the stem, the thin margins purplish spotted, glabrate, linearly oblong; head bracts pale white toward the base, otherwise fiery red, glabrous, 3 to 4 cm long, ovately oblong or elliptic, apex broadly rounded or subtruncate, pulverulent and purplish sprinkled along the thin margins, the lower ones apiculate at the apex; flowers usually 2 from the axils of the large bracts; the pair of bracteoles unequal in length, usually toothed, membranous and mottled; calyx tube longer, lobed; the lobes unequal, hyaline and similarly mottled; corolla tube about as long or longer than the calyx tube; lip very saccate and flaccid, hyaline and mottled, obovate, subentire or lobulate; filament short; anther long and linear, extended into a recurved appendage; style slender, the funnel shaped and ciliate stigma exerted from the tip of the anther spur. Fruiting heads longer and thicker; sessile capsules watery white, quite rigid though membranous, 2 cm long, 1.25 cm thick below the middle, splitting from the apex into 3 carpels nearly to the base, glabrous, striate; seeds attached to a fleshy white central placenta, shining black, short stipitate at the base, 5 mm long, 3 mm thick, ellipsoid, completely surrounded by a white aril which becomes irregularly lacerated from the apex toward the base.

Type specimen numbers 11730 in flower and 10545 in fruit, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, September and May respectively, 1909.

The flowering specimen was collected in loamy soil at 3750 feet altitude of dense forests south of the Baruring river. The fruiting material was found under similar conditions at 4250 feet altitude south of the Sibulan river. Very rare and the Bagobos called both numbers "Bogobog".

The ellipsoid seed is a character of the genus *Curcuma*, the seeds of *Zingiber* are described as angular.

Zingiber gigantifolium Elm. n. sp.

Loose clusters; erect stems recurved above the middle, up to 4 m high, with bulbose bases, leaf bearing nearly to the base. Blades ascending, dark green above, much lighter green beneath, the flat sides with ascending coarse corrugations, subcoriaceous, the basal ones smaller and different in shape, glabrous, smooth on both sides, alternate, apex short and rather sharply acute, curing lighter brown beneath, the edges deeper brown and glabrous, base obtuse, oblongish, sessile or nearly so, the larger ones 5 dm long by 10 to 14 cm wide at the middle or above it; sheath minutely ridged, glabrous or in the early state with a patch of grayish woolly hairs covering the reticulated sides, margins thinner and when old glabrous and brown; ligule 1.5 cm high, almost as broad, very rigid, broadly rounded, decurrent, usually the opposite one much smaller or even obsolete; midrib ridged beneath, grooved above, very stout at the leaf decurrent base. Heads upon 4 to 7 cm long ascending peduncles, the green stalk glabrous and subtended by a small leaf; the bracteate flowering head erect, cylindric, 9 to 12 cm long, about 4 cm thick across the middle, somewhat narrowed toward the apex, at the base subtended by an ascending oblong foliaceous glabrous bract 5 to 8 cm long; bracts densely imbricate, 4 cm long, rigid, obovately oblong, 2 cm wide across the truncately rounded apex, the edges thinner in texture, infolded and usually ciliate, apical edges rugose and inwardly curved; flowers usually in pairs or more from the axils of the large bracts and well enclosed by them; bracteole 12 mm long at the obtuse apex, the 2 bracteoles subtending the parallel 2 flowers contiguous below the middle, membranous, otherwise glabrous, whitish, conspicuously veined; the boot-like inner bracteole 3 mm longer, in texture venation color and vestiture similar to the bracteole, apical portion unequally and broadly toothed or lobulate; calyx tube reddish, very slender, nearly twice as long as the bracteoles, membranous, terminated by 3 yellowish oblong punctate lobes 4 mm in length; corolla red, the tube as long as the calyx tube, glabrous as is also the calyx; lip bent over the stamen, a trifle longer than the calyx segments, deeper red streaked, roundly toothed or subentire around the apex, obovoidly oblong in outline, pulverulent on the outer side; fertile filament few mm long, very thick and glabrous; anther in the bud state 5 mm long, oblong, the yellow cells longitudinally dehiscent, connective thick and black when dry, truncate and minutely emarginate at the top; style thread-like, bearing a small clavate stigma.

Type specimen number 9282, *A. D. E. Elmer*, Lucban (Mt. Banahao), Province of Tayabas, Luzon, May, 1907.

It was found in woods at 2250 feet altitude upon gravelly stream banks.

My field label does not definitely state that the heads were terminal but my recollection is that they were. The subtending foliaceous bract is a character of terminal inflorescences. Neither am I sure of the genus. The anthers are not even crested, much less with a long recurved beak. May it not be an *Adelmeria?*

Zingiber negrosense Elm. n. sp.

Several stemmed clumps; stems 2 m long, green, glabrous, 1.5 cm thick. Leaflets numerous, alternate, coriaceous, glabrous, divaricately spreading, shining, deep green on the upper surface, paler beneath, scattering every 5 to 8 cm or closer set toward the top, the basal ones reduced to mere bracts, the side more or less descending, broadly lanceolate, the slenderly acuminate apex recurved, sessile, obtuse at the base, when dry conspicuously lighter brown beneath, the normal blades 3 dm long, 4 to 5 cm wide at or a trifle below the middle, edges toward the base involute, entirely glabrous; sheaths only partly encircling the stems, much overlapping, glabrous, the brownish colored margins glabrous; ligule short, broadly rounded, at the base decurrent along the sheath, rigid, sparsely hairy on the sides and becoming glabrate; midrib ridged beneath, grooved above, stout where the blade attaches to the sheath. Inflorescence arising from the rootstock; peduncle 1.25 cm thick, curved, 5 to 8 cm long, reddish bracteate; bracts imbricate, submembranous, oblong, 3 to 5 cm long, glabrate or ciliate along the margins, obtusely rounded at the apex or notched; heads erect, ovoid, ellipsoid or obovoid, as long or longer than the stalks, 4 cm thick; its bracts numerous and dense, greenish except the reddish exposed portions, obovately elongated, 4 cm long, when young pubescent especially toward the base, ultimately glabrate, 1.5 cm wide across the truncate apex, the thin marginal sides usually folded upon the inner side, reddish and with deeper red spots toward the apex; flowers 1 or more from the axils of the large bracts; outer bracteole 4 cm long, saccate, 1 cm thick across the middle or widest portion, subhyaline, glabrous, longitudinally veined, whitish, purplish spotted toward the obtuse apex, the sides of the basal three fourths much overlapping; the inner bracteole 1 cm shorter and relatively narrower, otherwise similar; calyx tube 5 cm long, glabrous and with purple streaks; calyx at first broadly saccate, segments 2 cm long, hyaline, purplish veined and spotted, lanceolate and acuminately pointed, the upper one longer and more oblong in shape; lip obovately oblong, densely mottled with purple, subentire or bilobed; fertile filament short, membranous and purple spotted as is also the connective which is extended into a 1.5 cm long recurved beak, densely red mottled; anther cells yellow, longitudinally dehiscent, 1.5 cm long, parallel, glabrous; style very filiform, reddish streaked, extending through the beak; stigma small, funnel shaped, beset with hairs around the rim.

Type specimen number 10421, *A. D. E. Elmer*, Dumaguete (Cuernos Mts.), Province of Negros Oriental, Negros, June, 1908.

Discovered in wet earth along a streamlet of a ravine at 3500 feet altitude. Here is also referred my number 11768 from Davao, Mindanao, although I failed to find any flowers in the dried cones. The leaf characters of the Mindanao plant are exactly the same as in this Negros plant.

Zingiber sylvaticum Elm. n. sp.

Stems few to several from the same root, weak, strongly recurved or nearly prostrate, spreading, 1 to 2 m long, smooth, soft, terete, green, the basal one half provided with bracts. Leaves alternatingly scattered, soft, membranous, flat, much paler green beneath, not numerous, divaricate, the basal one smaller, glabrous except the sparsely pilose midrib on the nether side, lanceolate, 10 to 17 cm long, 2 to 2.5 cm wide across the middle or the widest portion, slenderly acuminate toward or at the apex, subattenuate toward the base, sessile; sheath becoming well separated, the thinner margins glabrous and red spotted, glabrate or sparsely pubescent toward the throat; ligule submembranous, few to 5 mm long, truncate or broadly notched across the apex, purplish spotted when young. Old infrutescent head flame red, 7 cm long by one half as thick, erect, upon a 7 to 12 cm long stalk arising from the bulbose base of the stem; peduncle 1.25 cm thick or thinner, ascending or erect, terete, glabrous at least when old, bract covered; bracts membranous, imbricate, the longer ones 3 dm long, oblong, glabrate or pulverulent on the outside toward the top, purplish striate and spotted toward the apex, the upper head bracts irregularly subtruncate across the apex and with the sides strongly rolled in upon the ventral side.

Type specimen number 9843, *A. D. E. Elmer*, Dumaguete (Cuernos Mts.), Province of Negros Oriental, Negros, April, 1908.

Gathered in damp earth of herbaceous thickets upon a steep wooded slope at 4250 feet altitude. Here is also referred my number 9283 from Lucban, Luzon. It is a rare plant, only to be found in subalpine woods.

This same type number *Dr. Ridley* referred under his new *Zingiber mollis* but our spikes are radical and there are other differences. Neither should it be confounded with *Zingiber apoense Elm.* nor with its nearest related species the common lowland *Zingiber zerumbet (Linn.) Smith.*

LEAFLETS OF PHILIPPINE BOTANY

EDITED BY A. D. E. ELMER, A. M.

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ASCOMYCETES PHILIPPINENSES—VII

Communicati a clar. *C. F. Baker*

by

H. Rehm

(*Munich, Germany*)

HYPOCREACEAE

HYPOXYLINA Starb.

Hypoxylina philippinensis Rehm sp. nov.

Perithecia sessilia, plerumque 2—4 in caespitulis orbicularibus — 2 mm latis, arcte congregata, atra, glabra, sphaeroidea, mox patellaria, distincte marginata, 0.3—0.8 mm lata, sicca valde corrugata, ad basim distincte parenchymatice, versus marginem ex cellulis circa 20 micro. longis, 10 micro. latis, pseudoprosenchymatice contexta, nigrocoerulea. Asci clavati, apice rotundati et crasse tunicati, 80—90 x 12 micro., 8-spori, I—. Sporae ellipsoidea, 1-cellulares, glabrae, subfuscae, 12—15 x 7 micro., 2-versus basim 1-stichae. Paraphyses hyalinae, vix visibilis.

Ad emortuos ramos *Derris philippinensis*, Los Baños, Ins. Philip., 2/1913, leg. *C. F. Baker*, no. 2006^a.

Fungus valde mirabilis, *Hypoxylinae Starb*. Cfr. *Sacc.* XXII, p. 454 secundum structuram excipuli et sporas subfuscas persimilis. Sed mihi non licuit papillulam, deciduam sec.

Starbaeck conspicere attamen fungum potius ad *Hypocreaceas*, quam ad *Ascomycetes* ponendum existimo.

NECTRIA Fries

Nectria flavido-carnea Rehm sp. nov.

Perithecia—20 botryose arcte congregata in acervulis 1—2 mm latis, superficialia, globulosa, 0.15—0.2 mm latis, citrino-flavida, glabra, minutissime papillulata, ad basim hyphis hyalinis, 30—100 x 3 micro. obsessa, sicca collabentia, dilute carneola, albido-pruinosa. Asci cylindraceo-clavati, circa 80 x 15 micro., 8-spori. Sporae oblongae, utrinque obtusae, medio septatae, non constrictae, utraque cellula magniguttata, 20 x 8 micro., 1—3-stichae. Paraphyses nullae. Ad basim conidia sporarum formae 8 x 4.5 micro. in hyphis brevibus.

Ad sarmentum emortuam, Los Baños, Ins. Philip., 1/1913, leg. *C. F. Baker*, no. 2408.

Pulcherrima species. Sec. cl. *Weese* in litt. appropinquat ad *Nectriam pityrodes Mont.* Syll. no. 784. Cfr. *Weese* Zeitschr. Gaehrungsphys. IV, p. 121—126.

Nectria discophora Mont. Syll. no. 782 sub Sphaeria.

Ad ramum *Theobroma cacao*, Los Baños, Ins. Philip., 8/1913, leg. *M. B. Raimundo*, comm. *C. F. Baker*, no. 1637^a.

Teste cl. *Weese* in litt. Cfr. *Weese*, Studien euber *Nectriaceen* Zeitschr. Gaehrungsphys. IV, p. 114—121 ubi synonyma plurima exstans, inter ea *Nectria Theobromae Mass.*, *Nectria striatospora A. Zimm.* et cfr. *v. Hoeh.* Fragm. Myc. XIV, p. 19.

Nectria tjibodensis Penz. et **Sacc.** Malp. XI, p. 512 **Gliricidiae Rehm** var. nov.

Ad *Gliricidiam sepium*, Los Baños, Ins. Philp., 8/1913, leg. *M. B. Raimundo*, comm. *C. F. Baker*, no. 1496 (1494).

Teste cl. *Weese* huc pertinet. Differt peritheciis e mycelio albidulo subcorticali late expanso caespitose erumpentibus, flava fuscidulis, fusce papillulatis. Cfr. *v. Hoeh.* Verzeichniss in Oester. Bot. Zeitschr. 1913, p. 34 ubi synonyma plurima.

Nectria subfurfuracea P. Henn. et Nym. Mons. I, p. 162.

Ad ramum emortuum humi jacentem, Mt. Maquiling, Ins. Philip., 12/1913, leg. *C. F. Baker*, no. 2132.

Teste cl. *Weese* in litt. huc pertinere videtur. Syn. *Nectria subcoccinea Sacc.* et *Ell.* inde prior. Cfr. *v. Hoeh.* Verzeichniss p. 33.

Nectria Leucaenae Rehm sp. nov.

Perithecia gregaria, plerumque in maculis epidermidis albidulis sessilia, globulosa, glabra, minutissime papillulata, demum umbilicata, 0.2 mm lata, ferrugineo-rubra, parenchymatice contexta, cellulis — 20 micro. latis. Asci cylindraceo-clavati, 70 x 10—12 micro., 8-spori. Sporae ellipsoideae, medio septatae, non constrictae, hyalinae, 10 x 5 micro., 2-stichae. Paraphyses nullae.

Ad emortuam *Leucaenam glaucam*, Los Baños, Ins. Philip., 8/1913, leg. *M. B. Raimundo*, comm. *C. F. Baker*, no. 1604.

Teste cl. *Weese* in litt. approximat ad *Nectriam Bolbophylli P. Henn.* cum pluribus aliis speciebus, cfr. Zeitschr. Gaehrungsphys. I, p. 143; II, p. 300.

CALONECTRIA de Not.

Calonectria sulcata Starb. Vet. Ak. Kob. XXV, 3, p. 29, tab. 1, fig. 52.

Ad *Ficum pseudopalma*, Los Baños, Ins. Philip., 7/1913, leg. *M. B. Raimundo*, comm. *C. F. Baker*, no. 1397^b.

Teste cl. *Weese* in litt. Syn. *Calonectria Meliae A. Zimm.*, *Calonectria Hibiscicola P. Henn.* Cfr. *Weese* Beitrag zur Kenntniss der Gattung *Calonectria* no. 5 in Myc. Centralb., April und Mai, 1914.

BROOMELLA Sacc.

Broomella Zeae Rehm sp. nov.

Perithecia in macula lata dilute rubidula, gregaria innata, sparsa, mox lineariter, arcte congregata, globulosa, non papillulata, dilute roseola, 0.1 mm lata, uda per rimas corticis emergentia, excipulo glabro parenchymatice tenuissime contexto, subhyalino. Asci fusiformes,—50 x 8 micro., 8-spori. Sporae fusiformes, 1-demum 3-septatae, hyalinae, 12—14 x 3—4 micro., distichae. Paraphyses mucosae.

Ad emortuum calamum *Zeae mays*, Los Baños, Ins. Philip., 11/1913, leg. *M. B. Raimundo*, comm. *C. F. Baker*, no. 1994.

PARANECTRIA Sacc.

Paranectria luxurians Rehm sp. nov. Exs. *Rehm*, Ascom. 2116.

Perithecia in mycelio *Meliolae Maesae* parasitica, dispersa, sessilia, ovata vel elongato-ovalia, dilute flavescentia, primitus glabra, postremo pilis dispersis, subcurvatis, obtusis, septatis, hyalinis,—50 x 4 micro. obsessa, 120—130 micro. alta, 80—100 micro. lata, poro minutissimo aperta, tenerrime pseudoparanchymatice contexta, ad basim hyalinis hyphis, 4 micro. latis. *Meliolae* affixa eamque saepe plane obtegentia. Asci clavati,—50 x 10 micro., 8-spori, I—. Sporae bacillares vel aciculares, rectae, 5—7-septatae, hyalinae, 30—40 x 2 micro., parallelae. Paraphyses nullae.

Ad *Meliolam Maesae*, Los Baños, Ins. Philip., 1/1913, leg. *C. F. Baker*, no. 699^b; ibidem, 4/1913, leg. *Eladio Sablan*, comm. *C. F. Baker*, no. 2882^b; ad *Meliolam Panicum* incolentem ibidem, 10/1913, leg. *C. F. Baker*, no. 2800.

Cfr. *Paranectriae* species apud *v. Hoeh.* Fragm. Myc. VII, p. 10—12. Nostra species ascis sporisque et paraphysibus nullis valde dissimilis.

DOTHIDEACEAE

OPHIODOTHIS Sacc.

Ophiodothis thanatospora (Lév.) Rac. Bull. Sc. Ak. Crac. 1906, p. 904, tab. 30, fig. 2. Syn. *Dothidea thanatospora Lév.* Ann. Sc. Nat. 1845, no. 248.

Ad *Centotheca latifolia*, Mt. Maquiling, Ins. Philip., 12/1913, leg. *C. F. Baker*, no. 2219.

Exacte convenit cum descriptione *Raciborski*.

CORYNELIACEAE

CORYNELIA Ach.

Corynelia clavata (Linn.) Sacc.

Ad folia *Podocarpi*, Mt. Banahao, Ins. Philip., 5/1914, leg. *Dr. E. B. Copeland*, comm. *C. F. Baker*, no. 3639.

HYSTERIACEAE

LOPHODERMIUM Chev.

Lophodermium Planchoniae Rehm sp. nov.

Perithecia in maculis orbicularibus, circa 0.5 cm latis, fuscidulis, tenerrime nigro marginatis, epi—, rarius hypophyllis, gregarie innata, primitus hemisphaerica, mox ellipsoidea, recta vel curvatula, nigra, rima tenuissima longitudinali, interdum triangulariter aperta, marginibus non distantibus, nitentia, 0.5—0.8 mm lata vel longa. Asci cylindracei, apice rotundati, 50—60 x 4—5 micro., 8-spori. Sporae filiformes, rectae, pluriguttulatae, hyalinae, 40 x 1 micro., parallele positae. Paraphyses filiformes, hyalinae, 1 micro. diam., apice non curvatae.

Ad folium *Planchoniae spectabilis*, Los Baños, Ins. Philip., 4/1914, leg. *C. F. Baker*, no. 3080.

Lophodermium Aleuritis Rehm sp. nov.

Apothecia in maculis hypophyllis orbicularibus luteis, 0.5—1 cm latis, gregaria, innata, oblonga vel fere orbicularia, rima tenuissima, aperta, 0.5—0.7 mm longa vel lata, nigra. Asci cylindracei, —70 x 5 micro., 8-spori. Sporae filiformae, rectae, hyalinae, 50 x 0.5 micro., parallelae. Paraphyses filiformes.

Ad folia emortua, Los Baños, Ins. Philip., 5/1913, leg. *C. F. Baker*, no. 3444.

Lophodermium Arundinaceum Chev.

Ad folia emortua *Livistonae*, in e acumine Mt. Maquiling, Ins. Philip., 6/1914, leg. *C. F. Baker*, no. 3422.

Hymenium evanidum, senile.

Lophodermium Arundinaceum Chev. form **vulgare Fckl.**

Ad calamos emortuos *Miscanthi japonici*, in e acumine Mt. Maquiling, Ins. Philip., 6/1914, leg. *C. F. Baker*, nos. 3537, 3540.

PHACIDIACEAE

COCCOMYCES de Not.

Coccomyces quadratus (Schm. et Kze.) Karst. Myc. Fenn. I, p. 255 **philippinus Rehm** var. nov.

Plane congruit fungus imprimis epiphyllus, eximie quadratus, laciniis 4-apertus, 1—2 mm latus.

Ad folia emortua *Neolitseae*, in e acumine Mt. Maquiling, Ins. Philip., 6/1914, leg. *C. F. Baker*, no. 3446.

Coccomyces dubius Rehm sp. nov.

Apothecia maculis hypohyllis nigris, 1—2 mm latis plerumque solitaria, interdum bina innata, hemisphaerica, poro pertusa, non distincte explanata, glabra, 0.4 mm lata. Asci fusiformes, longe anguste stipitati, 70 micro. longi, parte sporiferae 35—40 x 10 micro., 8-spori. Sporae fusiformes, rectae, 1—3-septatae, hyalinae, 20 x 3 micro., parallele juxta positae, I—. Paraphyses filiformes, apice obtuse curvatae,—3 micro. circa hyalinae.

Ad folia *Fici minahassae*, Los Baños, Ins. Philip., 5/1914, leg. *S. A. Reyes*, comm. *C. F. Baker*, no. 3480.

Exemplaria imperfecte evoluta, apothecia denudata non praebent, potius *Phyllachorae* habitum, attamen hymenii structura fungum ad *Phacidiaceas* ponendum cogiti.

RHYTISMA Fries

Rhytisma Lagerstroemiae Rabh. Hedw. 1878, p. 31. Syn. *Rhytisma Pongamiae B.* et *Br.* sec. *Cke.*, Grev. vi, p. 110. Exs. *Rabh.* Fung. Eur. 2310.

Ad folia *Lagerstroemiae speciosae*, Morong Valley, Ins. Philip., 1/1914, leg. *M. B. Raimundo*, comm. *C. F. Baker*, no. 2580.

Nunquam adhuc cum apotheciis collectum!

STICTIDACEAE

BRIARDIA Sacc.

Briardia maquilingiana Rehm sp. nov.

Apothecia maculis utrinque rufis, medio castaneo brunnis, orbicularibus, circa 5 cm, demum irregulariter—1 cm latis in epiphyllo gregarie, fere orbiculariter innata, primitus globoso clausa, folium perrumpentia et discum foveolarem, orbiculariter albido-cinctum, hyalinum, saepe longitudinalem, 0.2—0.5 mm latum vel longum, denudantia, in hypophyllo plusminusve hemiglobose prominentia. Excipulo fuscidolo crasso cum parenchymate folii connato. Asci cylindracei, apice rotundati,—120 x 10 micro., 8-spori, I—. Sporae oblongae, rectae, utrinque rotundatae, 1-cellulares, hyalinae, 12 x 5 micro., 1-stichae. Paraphyses nullae.

Ad folia *Tetrastigmatis*, Mt. Maquiling, Ins. Philip., 4/1914, leg. *S. A. Reyes*, comm. *C. F. Baker*, no. 3320.

Briardia roseolutescens Rehm cfr. *Sacc.* Syll. XVI, p. 776 sub *Briardia lutescens Rehm* quoad structuram internam similis, paraphysibus distinctis diversa.

PROPOLIDIOPSIS Rehm

Propolidiopsis Arengae Rehm

Ad emortuos petiolos *Arengae mindorensis*, Los Baños, Ins. Philip., 3/1914, leg. *C. F. Baker*, no. 2899.

CENANGIACEAE

CENANGIUM Fries

Cenangium Blumeanum Rehm sp. nov.

Apothecia dispersa, sessilia, primitus globoso-clausa, dein patellaria, disco tenuiter marginato plano, flavide rubescente, 1.5—2 mm lato, versus basim subconstricta, non stipitata, exciputo glabro, parenchymatice fusce contexta, versus marginem pseudoprosenchymatico. Sicca complicata, involute crasse marginata, disco albido-pruinoso. Asci clavati, dein cylindracei, apice rotundati, 40—45 x 5—6 micro., 8-spori, I—. Sporae ellipsoideae, 1-cellulares, biguttatae, demum 2—1-septatae, hyalinae, 4—5 x 2 micro., 1—2-stichae. Paraphyses filiformes, dilute rubescentes, epithecium non formantes, 1.5 micro.

Ad *Bambusam blumeanam*, Los Baños, Ins. Philip., 3/1914, leg. *M. B. Raimundo*, comm. *C. F. Baker*, no. 2927^b.

Cenangium (*Encoelia*) *helvolum* (*Jungh.*) *Sacc.* apotheciis stipitatis plane diversum. Cfr. *v. Hoeh.* Fragm. Myc. VI, p. 1030, con icones.

PATELLARIACEAE

LAGERHEIMA Sacc.

Lagerheima dermatoidea Rehm sp. nov.

Apothecia in caespitulis 2—3 mm latis, connata, primitus innata, 2—3 arcte congregata, dein erumpentia, atra, glabra, patellaria, crasse marginata, versus basim elongata, 0.3—1 mm diam., parenchymatice ex cellulis longitudinalibus fuscis parenchymatice contexta, crasse dermatoidea, sicca corrugata. Asci clavati, apice rotundati, crasse tunicati, 80—90 x 12 micro., 8-spori, I—. Sporae ellipsoideae, 1-cellulares, haud guttatae, subfuscae, 12—15 x 7—8 micro., 1—2-stichae. Paraphyses epithecium fuscum formantes, non discretae.

Ad ramum emortuum *Derris philippinensis*, Los Baños, Ins. Philip., 2/1913, leg. *C. F. Baker*, no. 2006^b.

Apothecia dermatoidea, itaque non ad *Cenangiaceas* ut *Phaeangium Sacc.* trahenda melius ad *Lagerheima Sacc.* Syll. X, p. 55. *Tympanis* similia ponenda species.

NIPTERA Fries

Niptera Grewiae Rehm sp. nov.

Apothecia in epiphyllo immaculato late dispersa, sessilia, primitus globosa, dein urceolata, mox explanata, orbicularia, glabra, 0.2—0.25 mm lata, nigra, disco hyalino acute marginato, excipulo parenchymatico, coeruleo-violaceo. Asci clavati, rotundati, 40 x 10 micro., 8-spori. Sporae fusoideae, utrinque attenuatae, medio septatae et subconstrictae, utraque cellula 1-guttata, 12—14 x 4 micro., distichae. Paraphyses filiformes, hyalinae, 1 micro. Hymenium I+.

Ad folia *Grewiae* Los Baños, Ins. Philip., 2/1914, leg. *C. F. Baker*, no. 2885.

TRICHOBELONIUM Sacc.

Trichobelonium Melioloides Rehm sp. nov.

Apothecia dispersa, plerumque singula, interdum bina, epiphylla, sessilia, primitus globuloso-clausa, dein urceolata, 0.2—0.25 mm lata, nigra, disco hyalino, excipulo membranaceo, parenchymatice nigrofusce contexto, scabriusculo, ad basim hyphis plurimis centrifugis,—2 mm excurrentibus, 3 micro. latis, simplicibus, rectis, septatis, fuscis coronata. Asci oblongo-clavati, 120—130 x 20—24 micro., apice rotundati crasse tunicati, 8-spori, I—. Sporae cylindraceae, rectae, utrinque rotundatae, transverse 7-septatae, 40—50 x 7—8 micro., hyalinae, 2—3-stichae. Paraphyses nullae.

Ad folia *Gigantochloae scribnerianae*, hills back of Paete, Ins. Philip., 4/1914, leg. *C. F. Baker*, no. 3115.

Haud parasitans in mycelio *Meliolae*, etsi ad basim mycelio hypharum centrifugarum insidens.

PEZIZELLA Fckl.

Pezizella ombrophilacea Rehm sp. nov.

Apothecia in epiphyllo immaculato dispersa, sessilia, primitus globosa, dein patellaria, sicca collabentia, nigra, glabra, 0.1 mm diam., tenuissime parenchymatice fusce contexta, versus marginem coerulescentia. Asci clavati, circa 30 x 10 micro, 8-spori, apice rotundati, sessiles, I—. Sporae ellipsoideae, medio septatae, non constrictae, hyalinae, 9—10 x 3 micro., distichae. Paraphyses tenerae, ramosae, subgelatinosae. Epithecium fuscum formantes.

Ad folia *Psidii guayavae*, Los Baños, Ins. Philip., 2/1913, leg. *M. B. Raimundo*, comm. *C. F. Baker*, no. 1984.

Exemplaria juvenilia, sporae modo in asco conspicuae.

HELOTIACEAE

SCLEROTINIA Fckl.

Sclerotinia nervisequia Schroet. Krypt. Schles. III, p. 65 **Bambusacea Rehm** var. nov.

Ad emortuam *Bambusam vulgarem*, Los Baños, Ins. Philip., 10/1913, leg. *S. A. Reyes*, comm. *C. F. Baker*, no. 1911; ad folia putrida *Dimerocalyx longipes*, Mt. Maquiling, Ins. Philip., 5/1914, leg. *S. A. Reyes*, comm. *C. F. Baker*, no 3221.

Plane congruit cum descriptione exemplaribusque originalibus in foliis *Alni* in Germania crescentibus, differt modo ascio sporisque paullulum brevioribus.

PEZIZACEAE

HUMARIA Fries

Humaria caballina Rehm sp. nov.

Apothecia congregata, sessilia, primitus globoso-clausa mox patellaria, irregulariter complicata, crasse marginata,—1 cm lata, disco rubro, excipulo glabro, avellaneo, crasse parenchymatice contexto, flavido, cellulis externus 5 micro. latis, sicca extus subrugulosa. Asci cylindracei, 60—70 x 6—8 micro., 8-spori, I—. Sporae ellipsoideae, 1-cellulares, interdum biguttulatae, glabrae, hyalinae, 5—6 x 4 micro., 1-stichae. Paraphyses filiformes. 1.5 micro., ad apicem 2.5 micro. latae. rubrae. Color ruber in aqua solvitur.

Ad stercorem equinum, Mt. Maquiling, Ins. Philip., 7/1914, leg. *Dr. E. B. Copeland*, comm. *C. F. Baker*, no. 3637.

Humaria magnitudine apotheciorum insignis, itemque minutie sporarum accedit ad *Humariam Guanaci Rehm*, et *Humariam merdariam Fries*.

PLICARIA Fckl.

Plicaria tropica Rehm sp. nov.

Apothecia gregaria, sessilia, primitus globoso-clausa, dein cyathoidea, demum plusminusve explanata, integra, crasse marginata, hymenio dilute fuscidulo, excipulo fuligineo-fusco. vix verruculoso, ad basim—1 cm lata, angustata, ibique nigrescentia, 2—4 cm lata, 2 cm alta, sicca valde complicata corrugataque, parenchymatice contexta, cellulis externis circa 15 micro. latis. Asci cylindracei,—200 x 9 micro., 8-spori, J—. Sporae subfusoideae, areolato-verrucosae, 1-cellulares, primitus guttulis parvulis oleosis 1—2 instructae, hyalinae, 10—12 x 6—7 micro., 1-stichae. Paraphyses filiformes 1.5 micro., ad apicem 2 micro. latae et subcurvatae, dilute fuscidulae.

Ad cinerem *Bambusae* cum stercore mixtum, Los Baños, Ins. Philip., 8/1913, leg. *M. B. Raimundo*, comm. *C. F. Baker*, no. 1445.

Peziza phyllogena Cke. Myc. tab. 65, fig. 251 similis, sed imprimis sporis diversa. Nostra species sporis areolato-verrucosis parvulis valde exstat inter *Plicariae ceteras Boud.* Disc. D'Eur. p. 46. Genus *Plicaria Fckl.* Symb. Myc. p. 325 alieno sensu construit, itant *Plicaria tropica* ad "*Aleuriacees* form *verrucispores*" pertineret.

HYSTERIACEAE

LEMBOSIA Lév.

Lembosia congregata Syd. Ann. Myc. VIII, p. 40.

Ad folia *Rhododendri Schadenbergii*, in e acumine Mt. Banahao, Ins. Philip., 2/1914, leg. *A. S. Cruz*, comm. *C. F. Baker*, no. 2981.

Lembosia crustacea (Cke.) Theiss. Ann. Myc. XI, p. 432, tab. 2, fig. 30—32. Cfr. *Morenoella breviuscula* (*Penz.* et *Sacc.*) *v. Hoeh.* Philip. Journ. Sci. VIII, p. 403. Syn. *Asterina crustacea Cke.* Grev. XIV, p. 13. *Morenoella gedeana Rac.* Parasit. Alg. und Pilze Javas III, p. 28.

Ad folia *Rhododendri Schadenbergii*, Mt. Banahao, Ins.

Philip., 3/1914, leg. *Nemesio Catalan*, comm. *C. F. Baker*, no. 2921.

Lembosia Eugeniae Rehm Philip. Journ. Sci. VII, p. 261.

Ad folia arboris in sylva, hills back of Paete, Ins. Philip., leg. *C. F. Baker*, no. 3137ᵃ.

Differt peritheciis — 1 mm longis, 0.5 mm latis, orbiculariter dispositis in mycelio nigritulo vix conspicuo.

Lembosia Pandani Rehm sp. nov.

Perithecia in maculis orbicularibus dilutissime fuscidulis, 5—8 mm latis, gregaria, adnata, linearia, recta, 0.5—1.5 mm longa, 0.2—2.5 mm lata, linea tenuissima aperta, dimidiata, prosenchymatice contexta, ad basim hyphis singulis centrifugalibus, late excurrentibus, interdum acutangulariter ramosis, fuscis, 4 micro. latis, cellulis singulis circ. 15 micro. longis. Asci ovales, — 50 x 25 micro., 8-spori. Sporae biscoctiformes, medio septatae et valde constrictae, fuscae, 20 x 9—10 micro. Paraphyses filiformes, gelatinoso-conglutinatae. Iodii ope coeruleae.

Ad *Pandanum*, hills back of Paete, Ins. Philip., 4/1914, leg. *C. F. Baker*, no. 3113ᵇ.

Mycelium vix visibile. *Lembosia Cocoes Rehm* forsitan modo matrice diversa.

HEMIHYSTERIACEAE

HYSTEROSTOMELLA Speg.

Hysterostomella spurcaria (B. et C.) v. Hoeh. Fragm. Myc. IX, p. 56. Syn. *Rhytisma spurcarium B.* et *Br.* Fung. Ceyl. no. 1131. *Rhytisma spurcarium B.* et *C.* Journ. Linn. Soc. 1873, XIV, p. 131. *Rhytisma constellatum B.* et *Br.* Fung. Ceyl. no. 1132. *Marchalia spurcaria Sacc.* Syll. VIII, p. 737.

Ad folia *Artocarpi incisae*, Los Baños, Ins. Philip., 1/1914, leg. *C. F. Baker*, no. 2393; ad folia *Artocarpi communis*, ibidem, 6/1913, leg. *S. A. Reyes*, comm. *C. F. Baker*, no. 2557.

Auctore *Theissen*.

POLYSTOMATACEAE

RHIPIDOCARPON Theiss. et Syd.

Rhipidocarpon javanicum (Pat.) Theiss. et Syd. Ann. Myc. XIII, p. 197. Syn. *Parmularia javanica* (*Pat.*) *Sacc.* et *Syd.* Syll. XIV, p. 709. *Schneepia javanica Pat.* Ann. Jard. Buit. 1897, I suppl., p. 122. *Lembosia javanica Rac.* Parasit. Alg. und Pilze Javas II, p. 20. Exs. *Rehm*, Ascom. 1839. *Syd.* Fung. Exot. 268.

Ad folia *Nipae fruticans*, Los Baños, Ins. Philip., 6/1913, leg. *S. A. Reyes*, comm. *C. F. Baker*, no. 2548; ibidem. 5/1913, leg. *J. J. Mirasol*, comm. *C. F. Baker*, no. 1220; ibidem, 2/1914, leg. *Nemesio Catalan*, comm. *C. F. Baker*, no. 2839.

LEAFLETS OF PHILIPPINE BOTANY

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ASCOMYCETES PHILIPPINENSES—VIII

Communicati a clar. *C. F. Baker*

by

H. Rehm

(*Munich, Germany*)

SPHAERIACEAE

ASCOSPORA Fries

Ascospora Vanillae Rehm sp. nov.

Perithecia per totum epi—et hypophyllum immutatum late gregaria, epidermidi innata, globulosa, glabra, non papillulata nec perspicue poro pertusa, circiter 100 micro. lata, parenchymatice fusce contexta. Asci clavati—80 x 12 micro., 8-spori. Sporae oblongae vel subglobulosae, granulis oleosis repletae, hyalinae, 1-cellulares, 10—12 x 5—7 micro., distichae. Paraphyses nullae.

Ad foliam *Vanillae*, Los Baños, Ins. Philip., 4/1914, leg. *C. F. Baker*, no. 3079.

Physalospora Vanillae A. Zimm. et *Laestadia Traversi Ces.* minime congruunt, *Ascospora Ophiorrhizae Rac.* valde appropinquat.

GUIGNARDIA PHIAL. et Rav.

Guignardia Dinochloae Rehm sp. nov.

Perithecia gregaria, innata, peridermium protuberantia, demum prorumpentia, globulosa, minute papillulata, nigra, glabra, 0.25 mm lata, parenchymatice crasse fusce contexta. Asci clavati, crasse tunicati, spice rotundati, 60—70 x 15 micro., 8-spori, I—, aparaphysati. Sporae oblongo-clavatae, rectae, 1-cellulares, hyalinae, 18 x 6—7 micro., distichae.

Ad *Dinochloam*, Los Baños, Ins. Philip., 12/1913, leg. *C. F. Baker*, no. 2189^{b}.

Propter defectum paraphysium cum *Guignardia humuline Bub.* aliisque in subgenus *Guignardiella Rehm* ponenda species.

Guignardia Bambusina Rehm sp. nov.

Perithecia numerosissima innata, epidermidem protuberantia, interdum rimose findentia, plerumque solitaria, rarius linealiter aggregata, globulosa, minutissime papillulata, nigra, glabra, 0.25 mm lata, parenchymatice contexta. Asci clavati, 0.6 x 10 micro., 8-spori. Sporae fusiformes, utrinque acutatae, rectae, 1-cellulares, 1—2-guttatae, hyalinae, 15—20 x 4 micro., distichae. Paraphyses nullae.

Ad *Bambusam* emortuam, Los Baños, Ins. Philip., 10/1913, leg. *S. A. Reyes*, comm. *C. F. Baker*, nos. 1898, 1915^{a}.

PHOMATOSPORA Sacc.

Phomatospora migrans Rehm sp. nov.

Perithecia in maculis epidermidis orbicularibus, dealbatis, perispherice migrantibus,—4 cm latis, demum confluentibus annulatim gregariae innata, lenticularia, minutissime ostiolata, nigritula, senilia denudata, 0 5 mm lata membranacea ex cellulis quadratis 20 x 10 micro. Asci ovato-clavati, sessiles, crasse tunicati, 60—80 x 20—24 micro., 8-spori, I—. Sporae ellipsoideae, 1-cellulares, hyalinae, 15—20 x 8—9 micro., 2—3-stichae. Paraphyses nullae.

Ad *Arengam sacchariferam*, Los Baños, Ins. Philip., 8/1913, leg. *S. A. Reyes*, comm. *C. F. Baker*, no. 1455.

PHYSALOSPORA Niessl.

Physalospora Hoyae v. Hoehn. Fragm. Myc. I, p. 122. *Berl.* Kais. Ak. Wiss. Wien 1907, CXIV. Syn. *Physalospora Hoyae Syd.* Leafl. Philip. Bot. 1914, VI, p. 2122.

Ad folia *Hoyae luzonicae,* Los Baños, Ins. Philip., 4/1914, leg. *C. F. Baker,* no. 3093.

Descriptio *Sydowii* l. c. deest.

Physalospora peribambusina Rehm sp. nov.

Perithecia plurima in culmis late dealbatis epidermidi gregarie innata, solitaria, interdum seriatim arcte congregata, peridermium elevantia, laciniatim vel linealiter perrumpentia, globulosa, minutissime papillulata, nigra, glabra, 0.12 mm lata. Asci clavati, crasse tunicati, 80—90 x 15 micro., 8-spori. Sporae ellipsoideae, 1-cellulares, interdum 1-magniguttatae, hyalinae, 18— 0 x 7—8 micro., distichae. Paraphyses filiformes. Excipulum parenchymaticum, crassum, fuscum.

Ad emortuam *Bambusam vulgarem,* Los Baños, Ins. Philip., 8/1912, leg. *C. F. Baker,* no. 6; ibidi, 10/1913, leg. *S. A. Reyes,* comm. *C. F. Baker,* nos. 1896, 1901.

Caute microscopii ope ab *Apiospora* dignoscenda. *Physalospora Bambusae* (*Rabh.*) *Sacc.* I, p. 446 imprimis sporis multo minoribus aliena.

Physalospora Dinochloae Rehm sp. nov.

Perithecia gregaria, innata, peridermium haud decoloratum protuberantia, globulosa, minutissime papillulata, nigritula, 100—120 micro, lata, glabra, parenchymatice contexta. Asci ovales, 45—48 x 25 micro., 8-spori. Sporae oblongo-subclavatae, rectae, 1-cellulares, hyalinae, 18—20 x 8 micro., strato muscoso hyalino 2 micro. lato, obductae, distichae. Paraphyses ? nullae.

Ad *Dinochloam,* Los Baños, Ins. Philip., leg. *C. F. Baker,* no. 2189^a.

ANTHOSTOMELLA Sacc.

Anthostomella uberiformis Rehm sp. nov.

Perithecia dispersa, cortici innata, dein prorumpentia demum in ligno late denigrato sessilia, globulosa, crasse carbonacea, verruculosa, glabra, apice disciformiter applanata, medio minute papillulata, ad basim 2—3 mm lata, 1.5 mm alta. Asci evanidi. Sporae ellipsoideae, interdum subcurvatulae, 1-cellulares, fuscae, 10—12 x 5—6 micro.

Ad truncum putridum, in e acumine Mt. Maquiling, Ins. Philip., 6/1914, leg. *C. F. Baker*, no. 3411.

Perithecii forma et magnitudine eximia species.

Anthostomella micraspis (**Berk.**) **Sacc.** et **Trav.** Syll. XXII, p. 101. Syn. *Sphaeria micraspis Berk.* Journ. Bot. 1849, p. 156, tab. 7, fig. 9.

Perithecia cortici haud mutato, in ligno linea nigra, late excurrente signato, innata, mox hemiglobose prominentia, demum fere sessilia, dispersa, vix papillulata, poro perspicuo-pertusa, 3—3.5 mm lata, 2 mm alta, glabra, crasse carbonacea, sessilia, verruculosa. Asci cylindracei, praelongi, ? 2-spori. Sporae oblongae, utrinque rotundatae, 1-cellulares, fuscae, 90—120 x 25—30 micro., distichae.

Ad ramos corticatos deciduos, Mt. Maquiling, Ins. Philip., 5/1914, leg. *C. F. Baker*, no. 2908; Los Baños, Ins. Philip., 4/1914, leg. *S. A. Reyes*, comm. *C. F. Baker*, no. 4025 (err. 2058).

Insignis et magnitudine peritheciorum et sporarum. Habitus lichenoides, sed gonidia nulla conspicua. Mycelium per corticem profunde per lignum migrans naturam *Pyrenomycetis* demonstrat, qui in cortice ipso innatus demum modo ad basim immersus exstat. *Anthostomella micraspis* forsitan haec species, sed propter descriptionem mancum dubia. Cfr. hanc speciem in Leafl. Philip. Bot. VI, p. 2197 valde diversam.

Anthostomella Arecae Rehm sp. nov.

Perithecia in cortice late fuscidulo innata dispersa, conoidea, ad basim extus nigrata, ab epidermide tenuissime marginata, in papillulam brevem protracta, poro perspicuo-pertusa, glabra, nigra, 1—1.5 mm lata, 1 mm alta, carbonacea. Asci resorpti. Sporae fusoideae, utrinque longe acutatae, 1-cellulares, fuscae, 70 x 9 micro.

Ad emortuos stipites *Arecae catechu*, Los Baños, Ins.

Philip., 4/1914, leg. *C. F. Baker*, no. 3068.

Perithecia primo obtutu fere sessilia circum denigrata demum attamen basi distincte innata, ab epidermide distincte marginata ad *Anthostomellam* hanc fungum ponunt. *Anthostomella bahiensis* (*Hempl.*) *Speg.* in *Sacc.* Syll. XXII, p. 96 imprimis sporis latioribus obtusis diversa.

Anthostomella Pandani (Rehm) Syd. Ann. Myc. XIII, p. 300. Syn. *Auerswaldia Pandani Rehm* Leafl. Philip. Bot. VI, p. 2273.

Ad basim foliorum *Pandani*, Mt. Banahao, Ins. Philip., leg. *C. F. Baker*, no. 2236.

Anthostomella mirabilis (B. et Br.) v. Hoehn. Exs. *Rehm*, Ascom. 1859; forma **discophora Syd.** Philip. Journ. Sci. VIII, p. 483 sub *Anthostomella*. Syn. *Auerswaldia Arengae Rac.* Pilze Javas II, p. 27.

Ad *Bambusam*, Los Baños, Ins. Philip., 4/1914, leg. *S. A. Reyes*, comm. *C. F. Baker*, nos. 3055, 3433, 3404, 3652.

Anthostomella mirabilis (B. et Br.) v. Hoehn. forma **Schizostachyi Rehm** ~~nov~~.

Ad culmos emortuos *Schizostachyi*, Los Baños, Ins. Philip., 2/1914, leg. *S. A. Reyes*, comm. *C. F. Baker*, nos. 2841, 3439, 3652.

Anthostomella Calami Rehm sp. nov.

Ad emortuum *Calamum*, Mt. Maquiling, Ins. Philip., 5/1914, leg. *S. A. Reyes*, comm. *C. F. Baker*, no. 3345; 4/1914, leg. *C. F. Baker*, nos. 3186, 3345.

Perithecia crasse carbonacea, verrucosula, ab peridermi carito adhaerente fere obducta, apice saepe subumbilicata et crasse breviter papillulata, foveolam crasse carbonaceam relinquentia. Ceterum ut in *Anthostomella mirabilis* (*B.* et *Br.*) *v. Hoehn.*

Anthostomella grandispora Penz. et Sacc. Malp. 1897, XI, p. 392.

Ad calamos emortuos *Bambusae*, Los Baños, Ins. Philip., 8/1913, leg. *S. A. Reyes*, comm. *C. F. Baker*, no. 1425; ad *Schizostachyum* emortuum, Los Baños, Ins. Philip., leg. *C. F. Baker*, no. 1954ᵃ.

Anthostomella Arengae (Rac.) Rehm. Syn. *Auerswaldia Arengae Rac.* Pilze Javas III, p. 27. Cfr. *v. Hoehn.* Fragm. Myc. IX, p. 52. *Auerswaldia decipiens Rehm* Philip. Journ. Sci. VIII, p. 395. Cfr. *Thiess.* et *Syd.* Myc. XIII, p. 390. *Anthostomella mindorensis Rehm* Philip. Journ. Sci. VIII, p. 399.

Ad petiolos et folia *Arengae mindorensis.*

Anthostomella Coryphae Rehm sp. nov.

Perithecia in maculis ellipsoideis, 1—2 cm longis, circiter 0.5 cm latis dilute nigritulis, cortici gregarie profunde innata, globulosa, aliquantulum convexe prominentia, vix papillulata, atra, 0.5—0.8 mm lata, parenchymatice contexta. Asci cylindracei, 100—110 x 15 micro., 8-spori, I— . Sporae oblongae, utrinque rotundatae, 1-cellulares, obscure fuscae, 10—15 x 8—10 micro., 1-stichae. Paraphyses filiformes.

Ad petiolos emortuos *Coryphae elatae*, Los Baños, Ins. Philip., 1/1914, leg. *C. F. Baker*, no. 2674.

Anthostomella Coryphae Rehm forma **minutissima Rehm** nov.

Sporae ellipsoideae, saepe subcurvatae, 15—16 x 6—7 micro., distichae. Perithecia arcte aggregata, 0.12 mm.

Ad *Corypham elatam*, Los Baños, Ins. Philip., 4/1913, leg. *G. Evaristo*, comm. *C. F. Baker*, no. 2572.

Anthostomella Donacina Rehm forma **Arengae Rehm** nov.

Ad *Arengam* emortuam, Los Baños, Ins. Philip., 4/1914, leg. *C. F. Baker*, no. 3064; ibidem, 10/1913, leg. *C. F. Baker*, no. 1797.

Omni modo congruit sporae 7—8 x 3 micro.

Anthostomella eumorpha (Sacc. et Paoli) Rehm. Syn. *Anthostoma eumorphum Sacc.* et *Paoli* Myc. Malac. no. 89.

Etsi exemplaria mea in peritheciis senilibus nullos ascos, modo sporas praebent, tamen descriptio l. c. plane quadrat, itaque sub hac nomina enumerantur. Potius fungum ad *Anthostomellam* pertinentem existimo.

Ad emortuum *Schizostachyum*, Los Baños, Ins. Philip., 10/1913, leg. *C. F. Baker*, no. 1021^b.

ROSELLINIA de Not.

Rosellinia bunodes (B. et Br.) Sacc. Syll. I, p. 254. Syn. *Sphaeria bunodes (B. et Br.)* Fung. Ceyl. no. 1088, tab. 8, fig. 38. Exs. *Rehm*, Ascom. 1293.

Ad ramum decorticatum deciduum, Los Baños, Ins. Philip., 4/1914, leg. *S. A. Reyes*, comm. *C. F. Baker*.

Rosellinia (Tassiella) horrida Rehm sp. nov.

Perithecia in basi atrata communi, 3—4 cm lata arcte congregata conjunctaque, lata basi sessilia, conoidea, apice obtusa, rarissime aliquantulum applanata, minutissime papillulata, carbonacea, nigrofusca, primitus albide pruinata, distincte verucosula, 2—2.5 mm alta, ad basim circiter 2 mm lata. Asci cylindracei, 8-spori. Sporae fusoideae, utrinque subacutatae, 1-cellulares, fuscae, 45—50 x 10—14 micro. Paraphyses?

Ad corticem emortuum, Mt. Maquiling, Ins. Philip., 3/1914, leg. *C. F. Baker*, no. 2909.

Peritheciis modo in basi communi congregatis, rarissime connatis *Roselliniae*, non *Hypoxyli* species existimanda, a *Rosellinia lamprostoma Syd.* peritheciis plurimis arcte juxtapositis, in papillulam protractis plane divergens.

Rosellinia (Tassiella) crustacea Rehm sp. nov.

Perithecia gregaria, mycelio late explanato fusco-nigritulo innata ab eoque obtecta, emergentia, conoidea vel hemisphaerica, minute papillulata, extus verrucosula, crasse fusce tunicata, 2—2.5 mm lata, senilia umbilicata. Asci evanidi. Sporae fusiformes, utrinque obtusae, rectae, obscure fuscae, 1-cellulares, 70 x 25 micro.

Ad calamos vivos *Schizostachyi*, Los Baños, Ins. Philip., 5/1914, leg. *S. A. Reyes*, comm. *C. F. Baker*, no. 3372.

Perithecia non distincte carbonacea, extus furfuraceo fusca, mycelio amorpho innata Quoad perithecia emergentia sporasque valde appropinquans ad *Rosellinia emergens* (*B.* et *Br.*) *Sacc.* Syll. I, p. 257.

Rosellinia lamprostoma Syd. Philip. Journ. Sci. VIII, p. 273.

Ad ramos emortuos *Strebli asperae*, Los Baños, Ins. Philip., 3/1914, leg. *M. B. Raimundo*, comm. *C. F. Baker*, no. 2975; ad emortuum *Damaenorops*, Mt. Maquiling, Ins. Philip., 1/1914, leg. *C. F. Baker*, no. 2720.

Rosellinia procera Syd. Ann. Myc. VIII, p. 37.

Ad emortuam *Alchorneam rugosam*, Los Baños, Ins. Philip., 11/1913, leg. *C. F. Baker*, no. 4024 (err. 2001).

Rosellinia (Coniomela) maquilingiana Rehm sp. nov.

Perithecia in plaga lata nigrescente conferta, sessilia, conoidea, primitus acute papillulata, poro vix perspicuo pertusa, glabra, atra, carbonacea, 0.5—0.8 mm lata et alta. Asci evanidi. Sporae ellipsoideae, interdum subcurvatae, 1-cellulares, fuscae, 15 x 6—7 micro.

Ad ramum corticatum deciduum, Mt. Maquiling, Ins. Philip., 5/1914, leg. *S. A. Reyes*, comm. *C. F. Baker*, no. 3347.

Pertinet ad seriem *Roselliniae pulveraceae Ehrh.* peritheciis conoideis, acute papillatis diversa, item a *Rosellinia bogoriensi P. Henn.* peritheciis conoideis, sporis non obtusis.

Rosellinia (Calomastia ?) Molleriana P. Henn. Hedw. 1902, p. 13. Exs. *Rehm*, Ascom. 1885.

Ad lignum decorticatum, Mt. Maquiling, Ins. Philip., 3/1914, leg. *C. F. Baker*, no. 4026 (err. 2913).

Exacte convenit cum exs. *Rehm* ex *Brasilia*, modo peritheciis minus congregatis divergens.

Rosellinia (Calomastia) sp?

Ad *Imperatam exaltatam*, Los Baños, Ins. Philip., 4/1914, leg. *S. A. Reyes*, comm. *C. F. Baker*, no. 3044.

Perithecia magna hymenio carentia, inde anonyma.

DIDYMELLA Sacc.

Didymella eutypoides Rehm sp. nov.

Perithecia gregarie innata, conoidea, peridermium extus cinereum elevantia, papillula brevi atra perforantia, 0.3 mm lata parenchymatice crasse contexta. Asci clavati,—80 x 10—12 micro., 8-spori. Sporae fusoideae, rectae, medio septatae, non constrictae, hyalinae, 20—22 x 5 micro., distichae. Paraphyses filiformes.

Ad *Bambusam* emortuam, Los Baños, Ins. Philip., 10/1913, leg. *S. A. Reyes*, comm. *C. F. Baker*, no. 1915^c.

Didymella maculosa Penz. et *Sacc.* ascis sporisque multo majoribus diversa. Habitus *Eutypellae* colore cinereo peridermii.

Didymella orchnodes Rehm sp. nov.

Perithecia in maculis epiphyllis orbicularibus, obscure, fuscis, senilibus medio albescentibus tenuiterque fusce marginatis, 0.5—1 cm latis gregarie innata, globulosa, hemisphaerice protuberantia, minutissime papillulata, demum denudata, atra, 0.5—0 8 mm lata, excipulo crasso subcarbonaceo. Asci cylindrico-fusiformes, 50—60 x 5—7 micro., 8 spori. Sporae fusoideae, rectae, hyalinae, medio septatae, non constrictae, utraque cellula guttata, 10—12 x 3—4 micro., 1—2-stichae. Paraphyses filiformes 1.5 micro.

Ad folia? *Goniothalami*, Los Baños, Ins. Philip., 4/1914, leg. *C. F. Baker*, no. 3085^a.

Peritheciis magnis insignis species.

Didymella seriata Rehm sp. nov.

Perithecia innata, primitus solitaria, dein in seriebus longitudinalibus parallelis—2 cm longis, 2—3 mm latis arcte congregata, epidermidem perrumpentia, ab eaque utrinque marginata denudata, globulosa, minute papillulata, atra, glabra, 1—3-sticha, 0.12 mm lata, parenchymatice contexta, fossam nigram relinquentia. Asci clavati, apice rotundati, 90—100 x 9 micro., 8-spori. Sporae fusoideae, utrinque acutatae, medio septatae, non constrictae, hyalinae, 15—18 x 4 micro., distichae. Paraphyses filiformes.

Ad *Schizostachyum* emortuum, Los Baños, Ins. Philip., 10/1913, leg. *C. F. Baker*, no. 1954^b.

Peritheciis seriatim arcte aggregatis, valde diversa species a *Didymella eutypoides Rehm*.

MELANOPSAMMA Niessl.

Melanopsamma lichenoides Rehm sp. nov.

Perithecia in ramulo corticato lata fuscato vel dealbato laxe gregaria, ad basim innata, lenticularia, atra, nitentia, glabra, poro umbilicato pertusa, tenuiter carbonacea, 1 mm diam. Asci clavati, crasse tunicati, 60—70 x 10—12 micro., 4—8-spori, I—. Sporae oblongae, utrinque rotundatae, medio septatae et constrictae, quaque cellule 1-magniguttata, hyalinae, 20—24 x 10 micro., 1-stichae. Paraphyses filiformes.

Ad ramulos emortuos deciduos, Los Baños, Ins. Philip., 4/1914, leg. *C. F. Baker*, no. 3067^a.

Affinis *Melanopsamma salicaria* (*Karst.*) *Sacc.*

MASSARINULA Gen.

Massarinula Bambusincola Rehm sp. nov.

Perithecia innata, peridemio texta, globosa,, minutissime papillulata, seriatim longitudinaliter aggregata, hemisphaerice protuberantia, nigra, crasse parenchymatice contexta, 0.5—0.7 mm lata. Asci clavati, 7.0—7.5 x 12 micro., 8-spori. Sporae fusoideae, utrinque obtusae, interdum subcurvatae, medio septatae, non constrictae, cellula superiore interdum latiore, hyalinae, 18—20 x 4—5 micro., distichae. Paraphyses filiformes.

Ad emortuam *Bambusam vulgarem*, Los Baños, Ins. Philip., 10/1913, leg. *S. A. Reyes*, comm. *C. F. Baker*, no. 1915^b.

Massarinula Donacina Rehm sp. nov.

Perithecia in maculis viridulo-fuscis, circiter 1 cm latis, demum albidulis gregarie innata, subconoidea, minute papillulata, glabra, atra, carbonacea, 0.5—0.8 mm lata. Asci clavati, 36—40 x 7 micro., 8-spori. Sporae fusiformes, medio septatae, non constrictae, hyalinae, 10 x 3 micro., distichae.

Paraphyses filiformes conglutinati.

Ad calamos *Donacis cannaeformis*, Los Baños, Ins. Philip., 10/1913, leg. *M. B. Raimundo*, comm. *C. F. Baker*, no. 2013.

Exemplaria vetusta, inde descriptio manca.

MERRILL~~E~~OPELTIS P. Henn.

Merrill~~e~~opeltis Hoehnelii Rehm. Cfr. *Syd.* Philip. Journ. Sci. VIII, p. 483 con icones.

Ad *Dinochloa*, Los Baños, Ins. Philip., 12/1913, leg. *C. F. Baker*, no. 2189^{c}; ad petiolos emortuos *Arengae sacchariferae*, Los Baños, Ins. Philip., 5/1914, leg. *S. A. Reyes*, comm. *C. F. Baker*, no. 3371.

Merrill~~e~~opeltis Damaenoropsis Syd. Philip. Journ. Sci. VIII, p. 484.

Ad emortuum *Damaenorops*, Mt. Maquiling, Ins. Philip., 5/1914, leg. *S. A. Reyes*, comm. *C. F. Baker*, no. 3343.

Asci fusiformes, sessiles, 120 x 9 micro., 4-spori. Sporae 70 x 4 micro., hyalinae, distichae. Exemplaria egregie evoluta a descriptione l. c. inprimis sporis multo minoribus divergentia.

Merrilleopeltis Calami P. Henn. Cfr. *v. Hoehn.* Fragm. Myc. XIII, p. 54.

Ad *Calamum* emortuum, Mt. Maquiling, Los Baños, Ins. Philip., 1/1914, leg. *C. F. Baker*, no. 2739; ibidem, 4/1914, leg. *C. F. Baker*, no. 3189.

APIOSPORA Sacc.

Apiospora carbonacea Rehm sp. nov.

Perithecia gregaria, cortici innata, mox denudata ab eoque ad basim marginata, e lata basi conoidea, breviter papillulata, glabra, atra, carbonacea, 1—1.2 mm lata,—1 mm alta. Asci cylindracei,—130 x 12 micro., 8-spori, I—. Sporae cylindraceae, utrinque rotundatae, rectae, hyalinae, inaequaliter 2-cellulares, ad septum non constrictae, cellula superiore

17 micro., inferiore 10 micro. longa, 5 micro. latae, hyalinae, disticha. Paraphyses filiformes, creberrimae, 1.2 micro. lata.

Ad *Schizostachyum* emortuum, in e acumine Mt. Maquiling, Ins. Philip., 6/1914, leg. *C. F. Baker*, no. 3427^{a}.

Differt ab *Apiospora* inprimis peritheciis magnis carbonaceis, ita ut forsitan novi generis species existimanda. *Apiosporella aberrans* minutie peritheciorum et sporis basim septatis diversa.

Apiospora apiospora (Dur. et Mtg.) v. Hoehn.

Ad *Bambusam vulgarem* emortuam, Los Baños, Ins. Philip., 10/1913, leg. *S. A. Reyes*, comm. *C. F. Baker*, no. 1895; 8/1913, leg. *S. A. Reyes*, comm. *C. F. Baker*, 8/1913, no. 1435.

GIBBERA Fries

Gibbera philippinensis Rehm sp. nov.

Perithecia in caespitulis sessilibus, 0.5—0.8 mm latis, 2—4 arcte congregata, fere connata, globulosa, minutissime papillulata, glabra, nigra, 0.15 mm lata, subcarbonacea, sicca umbilicata. Asci fusiformes, 65—70 x 15—18 micro., 8 spori, I—. Sporae fusoideae, utrinque acutatae, medio septatae et constrictae, utraque cellula 1-magniguttata, valde scabriusculae, strato mucoso cinctae, nubiloso-hyalinae, 15—20 x 5—6 micro., 2-dien transverse 1-stichae. Paraphyses filiformes.

Ad emortuum *Schizostachyum*, Mt. Maquiling, Ins. Philip., 5/1914, leg. *C. F. Baker*, no. 2896.

Exemplar non plane maturum, tamen *Gibberam borneensem Ces*. Myc. Born. p. 21, tab. 4 in memoriam reveram.

NEOPECKIA Sacc.

Neopeckia rhodosticta (B. et Br.) Sacc. Cfr. *v. Hoehn.* Fragm. Myc. VI, p. 66; VII, p. 26.

Ad emortuos scapos foliorum *Pandani*, Los Banos, Ins.

Philip., 5/1914, leg. *S. A. Reyes*, comm. *C. F. Baker*, no. 3440.

Asci 90—100 x 12 micro. Sporae oblonga-fusoideae, medio septatae, non constrictae, utrinque 1·magniguttatae, hyalinae, dein dilute fuscidulae, 25 x 6—6.5 micro.

Neopeckia rhodosticta (B. et Br.) **Sacc.** var. **magnifica Rehm** nov.

Perithecia in mycelio late explanato fusco-nigro dispersa, rarius conferta immersa, globulosa, parenchymatice crasse e cellulis magnis contexta, nigrofusca, pilis praelongis, rectis, simplicibus, rarissime dichotomis, fuscis 4 micro. latis, mycelium formantibus obtecta, modo apice denudata et circa ostiolum planum, apertum dilute roseola, non verrucosa, 0.5—0.8 mm diam. Asci clavati, vix stipitati, 120—130 x 15 micro., 8-spori. Sporae fusoideae, rectae, medio septatae, et constrictae, primitus utraque cellula 2-magniguttata, hyalinae, demum subfuscae, 35—40 x 8—12 micro., distichae. Paraphyses filiformes, 1.5 micro., ascos superantes.

Ad *Pandanum sabutan*, Los Baños, Ins. Philip., leg. *S. A. Reyes*, 4/1914, comm. *C. F. Baker*, no. 3047.

Magnitudine sporarum imprimis a *Neopeckia diffusa* (*Schw.*) *v. Hoehn.* Fragm. Myc. VI, p. 66; VII, p. 25 divergens, e contrario *Neopeckiae nobilis Rick.* in *Sacc.* Syll. XXII, p. 187 in ramis putridis *Brasilae* appropinquans, attamen perítheciorum forma et magnitudina, sporisque—50 x 12 micro. verisimiliter diversa.

AMPHISPHAERIA Ces. et de Not.

Amphisphaeria Schizostachyi Rehm.

Ad emortuum culmum *Schizostachyi*, Los Banos, Ins. Philip., 11/1913, leg. *S. A. Reyes*, comm. *C. F. Baker*, no. 1966.

Amphisphaeria Arengae Rehm sp. nov.

Perithecia epidermidi longe extus atratae gregarie innata, eamque laciniatim perrumpentia et prominentia, globulosa, distincte breviter papillulata, nigra, glabra, carbonacea, 1 mm lata. Asci evanidi. Sporae oblongo-subclavatae, utrinque obtusae, medio septatae et constrictae, fuscae, 18—20 x 7—8 micro. Paraphyses evanidae.

Ad emortuam *Arengam*, Los Banos, Ins. Philip., 5/1914, leg. *S. A. Reyes*, comm. *C. F. Baker*, no. 3436.

DIDYMOSPHAERIA Fckl.

Didymosphaeria inconspicua Rehm sp. nov.

Perithecia gregaria, cortici dealbato innata, globulosa, glabra, fuscidula, ostiolo minutissimo vex conspicuo prominente, membranacea. Asci cylindracei, apice rotundati, 8-spori, 100 x 8 micro., I—. Sporae ellipsoideae, medio septatae et valde constrictae, utrinque subattenuatae, rectae, utraque cellula 1-magniguttata, fuscidulae, 12—14 x 5 micro., 1-stichae. Paraphyses nullae.

Ad ramum emortuum *Premnae odoratae*, Los Baños, Ins. Philip., 10/1913, leg. *C. F. Baker*, no. 2110^b.

Peritheciis membranaceis, plane absconditis et defectu paraphysiam notabilis species. *Phaeosphaerella ? donacina Speg.* in *Sacc.* Syll. XXII, p. 169 proxima videtur. Utraque ad *Phaeodidymella Rehm* n. gen. trahenda.

Didymosphaeria striatula Penz. et Sacc. Malp. 1901, p. 227. Icon. Fung. Javas tab. 8, fig. 2.

Ad emortuam *Bambusam vulgarem*, Los Baños, Ins. Philip., 10/1913, leg. *S. A. Reyes*, comm. *C. F. Baker*, no. 1903. Exs. *Rehm*, Ascom. 2107. Ad emortuum *Calamum*, Mt. Maquiling, Ins. Philip., leg. *S. A. Reyes*, 5/1914, comm. *C. F. Baker*, nos. 3344, 3345.

CLYPEOSPHAERIA Fckl.

Clypeosphaeria Bakeriana Rehm sp. nov.

Perithecia gregaria, cortici immutato innata, globulosa, peridermii clypeo atro orbiculari obtecta, hemisphaeria prominentia, minutissime papillulata, glabra, corbonacea,—2 mm lata,—1.5 mm alta. Asci cylindracei,—170 x 15 micro., 8-spori.

Sporae oblongae, utrinque rotundatae, medio septatae, non constrictae, utraque cellula guttis 2 oleosis magnis praeditae, hyalinae, demum obscure fuscae, 3-septatae, 30 x 12 micro., 1-stichae. Paraphyses plurimae, tenerrimae 1 micro. circiter

Ad ramulos *Eugeniae bataanensis*, Mt. Maquiling, Ins. Philip., 5/1914, leg. *C. F. Baker*, no. 3481^a. Forma minus evoluta; ad corticem *Grewiae stylocarpae* ibidem, leg. *C. F. Baker*, no. 3465.

Praeclara pulchra species, juxta *Clypeosphaeria euphorbicolam P. Henn.* ponenda, ad *Clypeosphaeria* (*Starbaeckiellam Sacc.*) massariosporam vergens.

METASPHAERIA Sacc.

Metasphaeria corruscans Rehm sp. nov.

Perithecia gregaria in maculis epiphylli orbicularibus, non marginatis, vox fuscidule decoloratis, demum corrugatis, 1—3 cm latis ad basim innata, hemisphaerice prominentibus, non papillulata, pero perspicuo pertusis, glabra, atra, membranacea, 0.3—0.5 mm lata. Asci clavati, apice rotundati, 50 x 10 micro., 8-spori. Sporae fusoideae, rectae, hyalinae, 3-septatae, 15 x 4—5.5 micro., distichae. Paraphyses filiformes.

Ad folia *Capparis horrida*, Los Baños, Ins. Philip., 3/1914, leg. *C. F. Baker*, no. 3033.

Foliis valde noxia videtur.

Metasphaeria incompleta Rehm sp. nov.

Perithecia in maculis epiphyllis suborbicularibus, dein saepe confluentibus, dilute albofuscidulis, nigre marginatis 0.5—1.5 cm latis gregarie innata, globulosa, vix papillulata, demum erumpentia, glabra, atra, parenchymatice contexta, 0.3—0.5 mm lata. Asci ovato clavati, 30 x 12—15 micro., 8 spori, I—. Sporae fusoidea, 3-septatae, non constrictae, hyalinae, 18—20 x 4.5 micro. Paraphyses conglutinatae.

Ad folia *Eugeniae?*, Mt. Maquiling, Ins. Philip., 3/1914, leg. *C. F. Baker*, no. 2936^b.

Sporae modo intra ascos repertae, inde dubitanter descriptae.

Metasphaeria Hibiscincola Rehm Leafl. Philip. Bot. VI, p. 2202.

Perithecia gregarie innata, mox protuberantia, globulosa, minutissime papillulata, nigra, glabra, 0.2 mm lata, parenchymatice contexta. Asci cylindracei,—150 x 6—7 micro., 8-spori. Sporae cylindraceae, utrinque attenuatae, rectae, transverse 3-septatae, non constrictae, hyalinae, 18—20 x 4—5 micro., 1-stichae. Paraphyses filiformes.

Ad corticem *Hibisci rosasinensis*, Los Baños, Ins. Philip., 8/1913, leg. *C. F. Baker*, no. 1429^b.

ZIGNOELLA Sacc.

Zignoella (Trematostoma) Nobilis Rehm sp. nov.

Perithecia arcte gregaria, latas plagas formantia, sessilia, conoidea, vix papillulata, potius umbilicata, poro pertusa, atra, glabra, subcarbonacea, 0.5 mm lata. Asci clavati, apice rotundati, 80—85 x 12 micro., 8-spori, I—. Sporae oblongo-fusiformes, rectae, primitus 4-guttatae, dein 3-septatae, quaque cellula 1-magniguttata, non constrictae, hyalinae, 15—18 x 5 micro., distichae. Paraphyses filiformes.

Ad emortuum corticatum *Citrum nobilem*, Los Baños, Ins. Philip., 5/1914, leg. *C. F. Baker*, no. 3229.

Metasphaeria papulosa (*Dur.* et *Mtg.*) *Sacc.* II, p. 168 ad *Cirtum*. Cfr. *Berl.* Icon. Fung. I, p. 140, tab. 154, fig. 3 differt peritheciis folicolis innatis, sporis 5-septatis, *Metasphaeria dispar Penz.* et *Sacc.* peritheciis subcutaneo erumpentibus, multo minoribus. *Zignoella lichenoides v. Hoehn.* exs. *Rehm*, 1862 accedit. Exemplaria nostra non plane evoluta videntur.

MELANOMMA Nke. et Fckl.

Melanomma mindorense Rehm Philip. Journ. Sci. VIII, p. 401. Syn. *Metasphaeria maculans Rehm* ibid.

Ad *Arengam sacchariferam*, Los Baños, Ins. Philip., 10/1913, leg. *S. A. Reyes*, comm. *C. F. Baker*, no. 1876.

ACANTHOSTIGMA de Not.

Acanthostigma Bambusae v. Hoehn. in *Berl.* Ab. Wiss. Wien XVIII, p. 334.

Ad *Bambusam blumeanam*, Los Baños, Ins. Philip., 12/1913, leg. *C. F. Baker*, no. 2187. Sporae 12—24 cellulares.

Ad *Bambusam blumeanam*, Mt. Maquiling, Ins. Philip., 6/1914, leg. *C. F. Baker*, no. 3535 (3418). Sporis medio subconstrictu, 14—18 cellulares.

LEPTOSPHAERIA Ces. et de Not.

Leptosphaeria orthogramma (B. et Br.) Sacc. Syll. II, p. 60. Syn. *Sphaeria orthogramma B.* et *Br.* N. Am. Fung. 922. Cfr. *Berl.* Icon. Fung. I, p. 68, tab. 54, fig. 6.

Ad culmos emortuos *Zeae mays*, Los Baños, Ins. Philip., 11/1914, leg. *M. B. Raimundo*, comm. *C. F. Baker*, no. 1996.

MASSARIA de Not.

Massaria bataanensis Rehm sp. nov.

Perithecia cortici immaculato innata, dispersa, globosa, hemisphaerice prominentia, minutissime papillulata, atra, glabra, 0.5 mm lata, parenchymatice crasse contexta. Asci clavati, crasse tunicati, apice rotundati,—120 x 20 micro., 8-spori, 1—. Sporae ellipsoideae, utrinque rotundatae, medio paullulum constrictae, 4-cellulares, cellulis mediis rhomboideis, apicalibus triangularibus, dilute flavidulae, dein brunneae, strato mucoso carentes, seniles corrugatae,—25 x 15 micro., 1—2-stichae. Paraphyses copiosae, filiformes, 1 micro. circiter.

Ad ramum *Eugeniae bataanensis*, Mt. Maquiling, Ins. Philip., 5/1914, leg. *C. F. Baker*, no. 3481^b.

Sporarum forma *Massariae Ulmi* similis.

TREMATOSPHAERIA Fckl.

Trematosphaeria maquilingiana Rehm sp. nov.

Perithecia dispersa, innato prorumpentia, semper ad basim epidermide arcte cincta, ex lata basi conoidea, ad apicem in papillulem brevem elongata, atra, glabra, 1—1.5 mm lata et alta, carbonacea. Asci cylindracei,—140 x 10 micro., 8-spori, I—. Sporae fusiformes, utrinque acutatae, rectae, 3-septatae, cellulis medianis longioribus, semper magniguttatae, non constrictae, fuscae, distichae, 35—40 x 6—7 micro. Paraphyses filiformes.

Ad emortuum *Calamum*, in e acumine Mt. Maquiling, Ins. Philip., 6/1914, leg. *C. F. Baker*, no. 3420.

Trematosphaeria maquilingiana Rehm var. **Schizostachyi Rehm** nov.

Perithecia hemigloboso-mamillaria, minutissime papillulata, 2—2.5 mm lata, 2 mm alta. Ceterum ut in specie.

Ad *Schizostachyum* emortuum, in e acumine Mt. Maquiling, Ins. Philip., 6/1914, leg. *C. F. Baker*, no. 3426.

Trematosphaeria Fendlerae Earle proxima videtur, sed peritheciis multo minoribus, itemque sporis aliena. Ceterae magnitudine peritheciorum similes species sporis pluriseptalis guadent.

LASIOSPHAERIA Ces. et de Not.

Lasiosphaeria mollis Rehm sp. nov. Syn ? *Lasiosphaeria culmorum Myist.* in *Sacc.* Syll. XXII, p. 212.

Perithecia latas plagas nigras formantia, arcte congregata, sessilia, globulosa, minutissime papillulata, mox collabentia, parenchymatice fusce contexta, 0.15 mm lata, pilis plurimis, simplicibus, rectis rarius curvatulis, septatis, fuscis,—200 micro. longis, 4—5 micro. latis obsessa et obtecta. Asci evanidi. Sporae hyalinae ellipsoideae, 3-septatae, non constrictae, 15—18 x 7—8 micro. Paraphyses ?

Ad *Bambusam blumeanam*, Los Baños, Ins. Philip., 9/1913, leg. *S. A. Reyes*, comm. *C. F. Baker*, no. 1734.

Ab *Herpotrichiae* speciebus peritheciis mollibus valde divergens.

CEUTHOCARPON Karst.

Ceuthocarpon Talaumae Rehm sp. nov.

Perithecia maculis primitus orbicularibus, dein late explanatis exaridis, albido-brunneis,—3 cm latis longisque, interdum tenuiter nigre cinctis in epiphyllo innata, gregaria, atra, glabra, poro minutissimo pertusa, globulosa vel suboblonga, 0.2 mm diam. membranacea. Asci cylindracei, 70—80 x 4 micro., 8-spori. Sporae filiformes, rectae, continuae, hyalinae, 50 x 1 micro., parallele positae. Paraphyses plurimae, filiformes, 2 micro. circiter.

Ad folia emortua *Talauma villariana*, Los Baños, Ins. Philip., 2/1914, leg. *M. B. Raimundo*, comm. *C. F. Baker*, no. 2843.

Proximum *Ceuthocarpon depokense Penz.* et *Sacc.* imprimis paraphysium defectu alienum.

Ceuthocarpon depokense Penz. et **Sacc.** Malp. 1897, XI, p. 405.

Perithecia maculis orbicularibus exaridis, hyalinis, anguste ferrugineo marginatis, 2—5 mm latis in epiphyllo gregarie innata, globulosa, glabra, nigra, ostiolo vix conspicuo, 0.2 mm lata, parenchymatice fusce contexta. Asci cylindracei, 60 x 4—4.5 micro., 8-spori. Sporae filiformes, rectae, vix nucleatae, hyalinae, 50 x 1 micro , parallele positae. Paraphyses filiformes, 1.5 micro., plurimae.

Ad folia *Dracontomelum cumingianam*, Los Baños, Ins. Philip., 3/1914, leg. *M. B. Raimundo*, comm. *C. F. Baker*, no. 2191^a.

Verisimiliter exemplaria ad hanc speciem pertinent, dubitanter modo propter paraphyses largas, in descriptione l. c. deficientes.

ACERBIA Sacc.

Acerbia Maydis Rehm sp. nov.

Perithecia gregaria innata, conoidea, papillula minutissime prominentia, nigra, glabra, 0.2 mm lata, parenchymatice contexta. Asci cylindracei, 100 x 10—12 micro., 3-spori.

Sporae bacillares, rectae, —15-septatae, dilute flavidulae, 70 x 3 micro., parallele positae. Paraphyses filiformes.

Ad emortuos Zeae mays, Los Baños, Ins. Philip., 11/1913, leg. *M. B. Raimundo*, comm. *C. F. Baker*, no. 1993.

Proxima *Acerbia culmigena Penz.* et *Sacc.* (*Bambusicola*) peritheciis, ascis sporisque guttulatis majoribus aliena.

LINOSPORA Fckl.

Linospora Elasticae Koord. Bot. Unters. p. 193, fig. 20.

Ad folia emortua *Fici*, Mt. Maquiling, Ins. Philip., 4/1914, leg. *Dr. E. B. Copeland*, comm. *C. F. Baker*, no 3179^a.

Linospora Pandani Rehm sp. nov.

Perithecia gregaria maculis follii dilute cinereis innata, lenticularia, clypeolo orbiculari nigro obtecta, minutissime papillulata poroque pertusa, glabra, 0.8 mm lata, parenchymatice fusce contexta. Asci cylindracei, versus apicem subattenuati, circiter 120 x 10 micro., 8-spori, I—. Sporae filiformes, utrinque acutatae, paullulum curvatae, non septatae, hyalinae, 60—70 x 1.5 micro., parallele positae. Paraphyses filiformes, guttatae, 5 micro.

Ad *Pandanum sabutan*, Los Baños, Ins. Philip., 4/1914, leg. *S. A. Reyes*, comm. *C. F. Baker*, no. 3045; ad emortua *Pandani utilissimae*, Mt. Banahao, Ins. Philip., 10/1913, leg. *C. F. Baker*, no. 2248.

Ophiobolus javanicus Penz. et *Sacc.*, et *Acerbia culmigena Penz.* et *Sacc.* *Pandanus* incolentes plane diversae species.

Linospora seriata (Syd.) Rehm. Syn. *Ophiobolus seriatus Syd.* Philip. Journ. Sci. VIII, p. 272.

Perithecia gregaria culmo intus atrato, extus dilute cinereo innata, longitudinaliter seriata, globulosa, atra, minutissime papillulata, epidermidem elevatam demum perrumpentia, membranacea, 0.2—0.3 mm glabra. Asci cylindracei, 90—95 x 10 micro., 8-spori. Sporae aciculares, apice superiore obtuso, inferiore acutato, subcurvatae, 8-guttata ? 8-cellulares, hyalinae,—80 x 4.5 micro., parallelae. Paraphyses nullae.

Ad emortuam *Bambusam blumeanam*, Mt. Maquiling, Ins.

Philip., 6/1914, leg. *C. F. Baker*, no. 3417.

Dubidanter modo hunc fungum ad *Linosporam* pono, sed peritheciis fere stromatice aggregatis huc pertinentem exestimo.

VALSACEAE

EUTYPELLA (Nke.) Sacc.

Eutypella lineolata Rehm sp. nov.

Stroma effusum, corticale, epidermide tectum ab strato superiore corticis mutato formatum, linea nigra per lignum excurrente notatum, circa acervulos peritheciorum vix elevatum nigrum. Acervuli gregarii, longitudinaliter et parallele seriati, per epidermidem vix elevatum prorumpentia, 0.5—1 mm longi. Perithecia—10 monostiche aggregata, globulosa, 0.4 mm lata, collis fasciculatim erumpentibus, cylindraceis, teretibus,—0.5 mm longis, ostiolis integris. Asci ovoidei, sessiles, 10 x 5 micro., 8-spori. Sporae allantoideae, 4—5 x 1,5 micro., hyalinae.

Ad *Mallotum philippinensem*, Los Baños, Ins. Philip., 4/1914, leg. *C. F. Baker*, no. 3060_b.

Etsi in consortio cum *Eutypella Malloti Rehm* crescem, tamen plane diversa, collis cylindraceis, sporis minutis gaudens.

Eutypella Malloti Rehm sp. nov.

Stroma crustaceum nigrum, subcortice serpens, circa perithecioram acervulos elevatum. Acervuli gregarii, tumiduli, 1—2 mm lati, corticem immutatum protuberantea et prorumpentes. Perithecia in quoque acervulo 5—10, globulosa, 0.4 mm lata, collis convergentibus praedita, ostiolis hemisphaericis, obtusis, distincte tenuiter striatis. Sporae allantoideae, curvulae, pallide melleae, 5—8 x 2 micro, in ascis clavatis, tenuiter stipitato 40 x 5—6 micro., 8-spori. Paraphyses nullae.

Ad *Mallotum philippinensem*, Los Baños, Ins. Philip., 4/1914, leg. *C. F. Baker*, no. ~~6030^{a}~~. 3060 a

Proxime videtur *Eutypella plagia* (*B.* et *C.*) *Berl.* Icon. Fung. III, p. 60, tab. 74, fig. 3.

MASSALONGIELLA Speg.

Massalongiella Imperatae Rehm sp. nov.

Perithecia striaeformiter—10 seriata, globulosa, membranaceae, nigra, glabra, 0.15 mm lata, cortici innata, eumque acervulatim longitudinaliter elevantia, longitudinaliter perrumpentia, ab marginibus corticis arcte adhaerentibus obtecta, modo papillulis peritheciorum nigris minutissimis longitudinaliter denudatis, in toto 2—2.5 mm longis, 1 mm lati acervuli. Asci ovales—35 micro.,? 8-spori. Sporae oblongae, obtusae, subcurvatae, hyalinae, 1-cellulares,– 25 x 6—7 micro. Paraphyses ?

Ad *Imperatam cylindricam*, Los Baños, Ins. Philip., 4/1914, leg. *S. A. Reyes*, comm. *C. F. Baker*, no. 3120.

Stroma nullum. Perithecia matrici immutato innato, membranacea. *Massalongiella Smilacis* (*Karst.* et *Har.*) *Berl.* Icon. Fung. III, p. 2, tab. 2, fig. 2 valde similis inprimis sporarum magnitudine plane aliena. Ab *Eutypella Bambusina* et *Arundinarieae* primo obtutu ejusdem generis defectu stromatis, ascis sporisque multo mojoribus dignoscenda.

NITSCHKEA Otth.

Nitschkea Bambusarum Rehm sp. nov.

Perithecia sub epidermide in plagulis irregularibus circiter 1 cm latis arcte, non valsiformiter aggregata, stromato tenuissimo nigritulo suffulta, dein peridermio laciniatim disrupto et ablato denudata, globulosa, haud papillulata, poro vix conspicuo pertusa, nigrofusca, 0.12 mm lata, glabra. Asci cuneato-clavati, lata, basi sessiles, 20—25 x 7 micro., 8-spori. Sporae allantoideae, 6—7 x 2 micro., hyalinae, distichae. Paraphyses nullae.

Ad emortuam *Bambusam vulgarem*, Los Baños, Ins. Philip., leg. *S. A. Reyes*, comm. *C. F. Baker*, nos. 1884, 1886.

Nitschkea recedens (*Niessl.*) *Berl.* Icon. Fung. III, p. 22, tab. 27, fig. 2 comparanda, sed multis notis aliena.

THYRIDARIA Sacc.

Thyridaria Calamincola Rehm sp. nov.

Perithecia innata, cortice demum delapso superficialia, valsiformiter 6—8 monostiche circa spermogonium in areola nigra, 3—3.5 mm lata arcte congregata, conoidea, minutissime papillulata, 1 mm alta,—1 mm lata, nigra, primitus corticis adhaerentibus obtecta, carbonacea. Asci fusiformes, perlongi, 4—8-spori. Sporae elongato fusiformes, utrinque acutatae, rectae, 1-dein 5—7-septatae, non constrictae, fuscae, 80 x 10—14 micro. Paraphyses ?

Ad emortuum *Calamum*, Mt. Maquiling, Ins. Philip., 5/1914, leg. *C. F. Baker*, no. 3230^{b}.

Sporis maximis longe diversa a speciebus adhuc descriptis. *Thyridaria crocosareae* (*B.* et *Br.*) *Cke.* videtur proxima. Cfr. *Sacc.* Syll. XI, p. 331.

Thyridaria eminens Rehm sp. nov.

Perithecia sub cortice in ligno late atrato nidulantia, valsiformiter 5—10 conjuncta, orbiculariter stromatice circiter 3 mm lata in basi denigrata collecta, per corticem prorumpentia, minutissime papillulata, poro pertusa, nigrofusca, membranaceae, nigro-coerulea e cellulis circiter 15 micro. latis contexta, glabra, demum verrucosula, primitus 0.5 mm lata, dein—1.25 mm longa,—1 mm lata. Asci elongato-ovoidei, —120 x 30 micro., 8-spori. Sporae oblongae, utrinque obtusae, 1—3-septatae, non constrictae, flavidulae, 30 x 12 micro., distichae. Paraphyses filiformes.

Ad emortuam *Streblus asper*, Los Baños, Ins. Philip., 3/1914, leg. *M. B. Raimundo*, comm. *C. F. Baker*, no. 2977.

Peritheciis demum longe prominentibus valde memorabilis.

XYLARIACEAE

HYPOXYLON Bull.

Hypoxylon annulatum (Schw.) Mont.

Ad corticem vetustum, Los Baños, Ins. Philip., 5/1914, leg. *C. F. Baker*, no. 2906. Exemplar destructum, ad emortuam *Perkiam timoriunam*, Los Baños, Ins. Philip., 5/1914, leg. *S. A. Reyes*, comm. *C. F. Baker*, no. 3438.

Hypoxylon granulosum Bull. Champ. p. 176, tab. 187, fig. 1790.

Ad ramum emortuum, Los Baños, Ins. Philip., 3/1914, leg. *S. A. Reyes*, comm. *C. F. Baker*, no. 2838.

Hypoxylon heamatostroma Mont.

Ad emortuum *Schizostachyum*, Mt. Maquiling, Ins., Philip., 3/1914, leg. *C. F. Baker*, no. 2904; ad emortuam *Bambusam*, ibidi, 9/1913, leg. *S. A. Reyes*, comm. *C. F. Baker*, no. 1894a.

Hypoxylon marginatum (Schw.) Berk.

Ad ramulos deciduos, in e acumine Mt. Maquiling, Ins. Philip., 6/1914, leg. *C. F. Baker*, no. 3483.

Hypoxylon marginatum (Schw.) Berk. var. **mammiforme Rehm** nov.

Stroma sub cortice in ligno late denigrato sessilia, per corticem erumpentia, orbicularia, 3—5 mm lata,—3 mm alta, atra. Perithecia 3—6 plane innata, 1.5 mm diam., in apice stromatis applanato modo disculo 1 mm lato, crenulato marginato, in centro mammoidee papillulato conspicua. Ceterim ut in species.

Ad ramulos deciduos, Mt. Maquiling, Ins. Philip., 5/1914, leg. *C. F. Baker*, no. 3038.

Valde distinguenda var. disculo mammoidee papillulato.

Hypoxylon rubigineo-areolatum Rehm var. **microsporum Theiss.** Cfr. Ann. Myc. VI, p. 345.

Ad emortuam *Polyscias nodosa*, Mt. Maquiling, Ins. Philip., 3/1914, leg. *C. F. Baker*, no. 2894.

Hypoxylon subeffusum Speg.

Ad truncum putridum, Los Baños, Ins. Philip., 2/1914, leg. *S. A. Reyes*, comm. *C. F. Baker*, no. 2837.

Hypoxylon Freycinetiae Rehm sp. nov.

Stromata dispersa, primitus innata, dein emergentia et sessilia, hemiglobosa, atra, glabra, carbonacea, apice in disculis 2—3 arcte juxtapositis applanatis minutissime papillulata, 2—4 mm lata et alta. Perithecia 2—3 arcte connata, 0.8—1 mm lata, globosa. Asci evanidi. Sporae ellipsoideae, rectae, 1-cellulares, fuscae, 10 x 5 micro. Paraphyses ?

Ad emortuas caules *Freycinetiae*, in e acumine Mt. Maquiling, Ins. Philip., 6/1914, leg. *C. F. Baker*, no. 3416.

Auerswaldiae similis, attamen propter peritheciorum innatorum formam et magnitudinem potius *Hypoxylon*.

NUMMULARIA Tul.

Nummularia fragillima Rehm sp. nov.

Stromata gregaria, cortici innata abeoque arcte elato-marginata, erumpentia et prominentia, orbicularia, demum confluentia et oblonga, 3 mm—1.8 cm longa,—8 mm lata, plerumque applanata, vix convexula, nigrofusca, carbonacea, ostiolis nullis conspicuos, fragilissima. Perithecia elongato ovalia, arcte congregata, 0.3—0.4 mm lata et alta. Asci evanidi. Sporae fusoideae, utrinque acutatae, rectae, 1-cellulares, fuscae, 20—24 x 7—8 micro.

Ad *Calamum* emortuum, Mt. Maquiling, Ins. Philip., 4/1914, leg. *C. F. Baker*, no. 3187.

Valde egregia species et stromatum forma indoleque et sporarum magnitudine.

Nummularia Lianae Rehm sp. nov.

Stromata emergentia, a cortice marginata, irregulariter longitudinalia, 2—3 cm longa, 1—1.5 mm lata, cortice evanido demum fere sessilia, undulato-plana, atra, 1 mm crassa ostiolis minimis punctulata. Perithecia conoidea, 1-stiche arcte aggregata, 0.8 mm lata. Asci cylindracei,—80 x 9 micro., 8-spori. Sporae ellipsoideae, 1-cellulares, fuscae, 10 x 5—6 micro. Paraphyses filiformes.

Ad emortuam lianam, verisimiliter *Bauhiniam*, Mt. Maquiling, Ins. Philip., 3/1914, leg. *C. F. Baker*, no. 2881.

Stromatibus irregularibus, cortice delapso fere sessilibus ab cognatis inprimis divergens.

Nummularia memorabilis Rehm sp. nov.

Stromata dispersa, cortici interiori innata abeoque marginata, dein erumpentia et fere libera, subtus lineola nigra profunde lignum percurrente notata, irregulariter orbicularia, solitaria interdum congluentia, distincte marginata, atra, glabra, 5—10 mm lata, 2 mm alta, carbonacea, verrucosula. Perithecia 1-stiche innata, globosa, circiter 0.5 mm lata, in superficie stromatis applanato-marginata, papillula minuscula prominente. Asci evanidi. Sporae ellipsoideae, rectae vel curvatulae, 1-cellulares, fuscae, 9—10 x 3.5—4 micro.

Ad lignum emortuum, in e acumine Mt. Maquiling, Ins. Philip., 7/1914, leg. *C. F. Baker*, no. 3432.

Nummularia diatrypeoides Rehm similis.

Nummularia Reyesiana Rehm sp. nov.

Stromata dispersa, sessilia, matrici adnata, convexula, mox applanata, orbicularia, dein irregulariter explanata, 3—6 mm lata, 1—1.5 mm alta, extus albide cineres pruinosa, intus atra, carbonacea, zonula orbiculari demum atra, 0.5 mm lata cincta ostiolis minimis vix conspiculis. Perithecia ovoidea, 0.3 mm diam., 1-stiche congregata. Asci cylindracei, 120—150 x 10—12 micro., 8-spori, I+. Sporae ellipticae, utrinque obtusae, saepe subcurvatae, 1-cellulares, fuligineo-fuscae, 18—20 x 7—9 micro., 1-stichae. Paraphyses filiformes.

Ad *Bambusam* emortuam, Los Baños, Ins. Philip., 1/1913, leg. *S. A. Reyes*, comm. *C F. Baker*, no. 1906.

Pulchra species, a *Nummularia minuta Penz.* et *Sacc.* stromatibus majoribus, sporis duplo longioribus diversa, ad honorem collectoris *Ascomycetum* Philip. indefessi nominata, *Hypoxylon culmorum Cke.* Grev. VII, p. 51 exs. *Ellis* et *Ev.* N. Am. Fung. 2116 privev obtusa valde similis peritheciis singulis demum prominentibus divergis. *C. F. Baker*, nos. 1114, 1624, ad *Bambusam blumeanam* sub *Hypoxylon culmorum* ex *Bambusam* huc pertinent. Cfr. Leafl. Philip. Bot. VI, p. 2203. Item ad *Bambusam blumeanam*, Los Baños, Ins. Philip., 4/1913, leg. *C. F. Baker*, no. 2574.

Nummularia scutata B. et Cke.

Ad ramos emortuos deciduos, in e acumine Mt. Maquiling, Ins. Philip., 6/1914, leg. *C. F. Baker*, nos. 3419, 3431. Ad ramos emortuos *Cyrillae*, ibidi, leg. *C. F. Baker*, no. 3414.

Nummularia Citrincola Rehm sp. nov.

Stromata congregata cortici late denigrato, innata, dein erumpentia, orbicularia, glabra, nigro-fusca, applanata, plerumque obtuse marginata, papillulis pluribus minutissimis-obtusis prominentibus, 1—1.5 mm alta, 0.5—2 mm lata, crasse fusce parenchymatice contexta, ad basim hyphis fuscidulis, subramosis obsessa. Asci clavati, apice rotundati, crasse tunicati, 70—80 x 20—25 micro., 8-spori, monostiche stromati fusco-celluloso innati. Sporae ellipsoideae, 1-cellulares, rubrofuscae, 20 x 12 micro., distichae.

Ad *Citrum* emortuum, Los Baños, Ins. Philip., 4/1914, leg. *C. F. Baker*, no. 3062.

Stroma quoad hymenium non plane evolutum!

KRETZSCHMARIA Fries

Kretzschmaria sp.

Ad corticem trunci putridi, Los Baños, Ins. Philip., 9/1913, leg. *M. B. Raimundo*, comm. *C. F. Baker*, no. 2853.

Stromata destructa.

XYLARIA Hill.

Xylaria ? tabacina (Kick.) Berk.

Ad truncum emortuum, Mt. Maquiling, Ins. Philip., 6/1914, leg. *C. F. Baker*, no. 3395.

Xylaria (Thamnomyces) sp.

Ad rachidem emortuam *Calami*, Mt. Maquiling, Ins. Philip., 4/1914, leg. *C. F. Baker*, no. 3184; ad *Arengam*, Los Baños, leg. *S. A. Reyes*, comm. *C. F. Baker*, no. 3054ᵃ.

Stromata tenuissime filiformia, perlonga, interdum dichotoma peritheciis carentia.

LEAFLETS OF PHILIPPINE BOTANY

EDITED BY A. D. E. ELMER, A. M.

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ZINGIBERACEAE of the SORSOGON PENINSULA

by

A. D. E. Elmer

ADELMERIA Ridl.

Adelmeria gigantifolium (Elm.) Elm. n. comb. *Zingiber gigantifolium Elm.* Leaf. Philip. Bot. VIII, 2916, 1915.

Stems nearly 2 cm. thick, 1 to 2 m. high or long, ascending, leaflet bearing from near the base, the basal portion enlarged. Blades alternating every 7 to 10 cm., wider apart and reduced toward the base, the terminal ones narrowest, rigidly coriaceous, margins wavy, tips abruptly recurved, strongly folded at the base, otherwise flat, much lighter green beneath, chiefly horizontal. Heads erect, terminal, solitary, rigid, 7 to 12 cm. long, subtended by a foliaceous bract, entirely ruber to purpureus even the young ones, tickest across the middle; the outer bracts rigid, the equally rigid flowers just equalling them and similar in color; the floral bracts hyaline and veined, glabrous, broad and well surrounding the flowers, irregularly toothed at the apex and ciliated along the edges of the teeth, 5 to 8 mm. long, soon becoming shredded; ovary glabrous, subsessile; calyx 1 cm. long, subinflated above the middle, terminated by 2 or 3 acute teeth whose tips are usually pubescent, conspicuously parallel veined; corolla tube 2.25 cm. long, glabrous, very slender toward the base, gradually thickened toward the lobes; lobe obovately oblong, 1 cm. long, glabrous, gradually tapering toward the base, the sides inflexed, terminated by 2 lateral lobules and a central appendage; terminal lobule divaricate, hyaline, parallel veined and with few cross bars, ovately oblong; the

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central extension ticker in texture, shorter, with a truncate apex; lip as long as the lobe, obovately oblong, [the lamina portion hyaline, parallel veined, obtusely terminated, attenuate toward the base; filament short, adnate to the basal portion of the lip; anther 4 mm. long, bifid at both ends, 1.75 mm. wide, apex truncate or very slightly notched, entirely glabrous; style 5 mm. long, bearing a subclavate stigma, slender, glabrous, surrounded by a stockade of linear erect and glabrous appendages 2.5 mm. in length.

Represented by numbers 16154 and 14603, *Elmer*, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, May, 1916.

Small, more or less scattering clumps in wet ground of talus beds below a ledge of a very densely shaded place at 1750 feet altitude.

In the original descrption of this species, I expressed the possibility of it belonging to the genus *Adelmeria*.

Adelmeria albidum Elm. n. sp.

Several stemmed tussocks. Stems bulbose at the base, terete, 2 cm. thick, 1 to 2 m. high or long, ascending, the basal one third leafless. Leaves ascending or horizontal, alternating, rigidly coriaceous, flat except the recurved tips, the middle ones longest and broadest, 35 to 45 cm. long, 12 cm. wide across the middle or above it, entire, the brown marginal line minutely involute, glabrous, oblong though more gradually tapering toward the sessile or subsessile base, apex acute, base rather obtusely rounded and frequently one sided, connected with the ligulate portion, the terminal blades narrower, the few lower blades scattering and much reduced, duller green above in the fresh state, both sides curing grayish; midvein stout, especially toward the base, glabrous and of the same color, sunken above, prominent beneath and more or less striate; lateral nerves much ascending, obscure yet more evident on the upper side at least in the dry state; sheath easily separating from the stem, glabrous, finely striate, edges fringed with a marcescent dull brown margin especially toward the top; ligule at least 1.25 cm. long, somewhat narrower, broadly oblong, quite rigid and reddish brown, subglabrous, apex irregularly obtuse or lobulate, rather conspicuously reticulate on the exposed side. Heads terminal, solitary, erect, upon the upper side of the stem, subtended by a foliaceous bract, the sheath portion of this bract envelopes the young ones; peduncle 3 to 5 cm. long or occassionally longer, ascendingly curved, stout, glabrous, terete; inflorescence 8 to 13 cm. long, about 5 cm. across the middle, white throughout, even in the bud state as well as the fruiting ones, rigid; outer bracts imbricate, the average ones 3.5 cm. long, cuneately obovate to oblongish, apex broadly obtuse to subtruncate, 2 cm. wide above the middle, gradually tapering toward the broad base, striate in the dry state at least, glabrous, the thin more or less brownish margins fringed with whitish ciliate hairs; bracts surrounding the flowers 1.5 cm. long, hyaline, connate toward the base, obscurely toothed or becoming lacerated, the young ones with a subtruncate apex whose margins are finely ciliate, with parallel veins; flowers rigid, white, with a central yellowish spot, equalling the outer bracts; ovary glabrous, upon a short pedicel; calyx nearly 1.5 cm. long, loosely surrounding the tube above the middle, veiny and coarsely reticulate, the upper one third divided into 2 or 3 lobes whose obtuse points are puberulent; corolla tube a trifle less than 2 cm. long, slender, glabrous; lobe 1 cm. long, broadly linear, with its thin sides inflexed, broadly bilobed at the apex, the middle portion extended into a narrower but thicker erect crest, the lateral lobes divaricate and faintly reticulate; lip obovately oblong, 1 cm. long, also glabrous, attenuate toward the base, apex obtusely rounded, hyaline, coarsely veined and reticulated; filament very short, adnate to the basal portion of the lip; anther 5 mm. long, 1.5 mm. wide, curved, glabrous even the connective whose apex is truncate or only slightly emarginate; filiform style 8 mm. long, terminated by a clavate stigma, surrounded at the base by a group of linear erect fleshy appendages 2 mm. in length, all glabrous.

Type specimen number 15912, *A. D. E. Elmer*, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, April, 1916.

Only occasionally met in wet humus covered soil of dense forests of rather steep inclines at 1500 feet altitude. In habit and general aspects it is quite similar to *Adelmeria gigantifolium Elm.* but the heads are always white.

Over twelve years ago I collected this white headed *Zingiberaceous* species at Sablan, province of Benguet. In the Bureau of Science my specimen number 6255 from northern Luzon is placed under the genus *Zingiber*, and in Philip. Journ. Sci. IV, 170, 1909, *Dr. Ridley* reported it as an unidentifiable plant.

ALPINIA Linn.

Alpinia pubiflora (Benth.) K. Schum.

Field-note:—Small or few stemmed clumps in moist ground of woodlands near a stream at 750 feet altitude. Stem terete, dark green, 5 feet high, .5 inch thick toward the enlarged base, arising from a yellowish rhizome; leaves thinly coriaceous, alternating every 3 to 5 inches, scattering and bract-like toward the base which is one third from the grouud, flat except the tips, very dark green above, slightly lighter beneath, ascending or horizontal; the suberect terminal young infrutescence green especially the globose fruits.

Represented by number 16546, *Elmer*, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon. July, 1916.

Mainly distinguished from *Alpinia flabellata Ridl.* by the brown pubescent inflorescence.

Alpinia elegans (Presl) K. Schum.

Field-note:— Rank masses in black ground along stream flats at 500 feet altitude. Stems erect, scattered, terete, 1 inch thick at least, bulbose and reddish at the base, 7 to 12 feet high; leaves from below the middle, the lower ones much reduced, descending, chartaceous, nearly flat, paler green beneath, alternating, 3 to 5 inches apart, tips straight but strongly twisted; inflorescence terminal, erect, rigid, a foot long, the angular and crooked rachis yellowish green; the lateral clusters ascending, alternating, few to several flowered, well clothed by brown marcescent sheaths; boot of flower rigid and reddish tinged, spit toward the apex on the upper side from the erect ovoidly fusiform yellow bud; flowers odorless, cremeus, facing the rachis, the upper and outer two segments reflexed, so also the apical portion of the inner upper more whitish one, the lower elongated lip nearly straight; anthers well crested, erectly curved; fruits short ellipsoid, yellowish green, when young erect or subpendant when mature, smooth and glabrous, with numerous seeds.

Represented by number 14670, *Elmer*, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, October, 1915.

Very common in wet alluvial soil and mostly confined along creeks and rivers of the valley where it forms jungled masses over large areas. The seeds with the meaty covering are edible. First collected by *Haenke* in his exploration of Sorsogon province.

Alpinia graminea Ridl.

Field-note:—Rather large tussocks in open dry land at 1500 feet altitute. Stems erect, subterete, pale green;

a yard high; leaflets ascending, alternating, coriaceous, darker green above, conduplicate; inflorescence terminal, erect, few paniculately branched, greenish though the odorless flowers are cremeus.

Represented by number 16228, *Elmer*, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, June, 1916.

Leaves rather broad, and for this reason it approaches certain forms of *Alpinia flabellata Ridl.*

Alpinia pyramidata Blm.

Field-note:—Clusters or tussocks in wet rich soil on slopes of hills at 1000 feet altitude and facing the Pacific ocean. Rhizome strongly aromatic; stems terete, strict, 1 to 2 yards high, 1 inch thick, green especially along the leaf bearing portion, swollen at the base; leaves alternating, ascending or horizontal, chartaceous, nearly flat, paler and short pubescent beneath; the pyramid-like inflorescence terminal, erect, 1 foot long more or less; rachis and pedicels yellowish green, the succulent flowers cremeus.

Represented by number 16352, *Elmer*, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, June, 1916.

Only met here and there, and was observed both in cultivation and in the wild state. The Bicols call it "Lanquas".

Alpinia haenkei Presl

Field-note:—Perennial clusters, in black soil along somewhat swampy ditches or gullets of the hemp region at 500 feet altitude. Stem hard, ascending, 1.5 inch thick toward the base, 4 to 9 feet high; leaflets ascending, paler beneath, conduplicate, margins coarsely wavy, subchartaceous, the longest ones 3 feet long; inflorescent spike terminal, erect, green, terete, averaging a foot in length; flowers showy, divaricate from all sides, odorless; bracts with calyx white, corolla yellowish except the reddish central portion; stamens creamy white; fruting pedicels greenish; the ripe fruits globose, .5 inch in diameter, mineatus; seeds brown and covered with a thin whitish covering.

Represented by number 14401, *Elmer*, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, October, 1915.

Quite common in our province, extending from the valley up into the subalpine region. *Haenke* originally collected it at Sorsogon.

Alpinia rufa (Presl) K. Schum.

This species was also originally discovered by *Huenke* in Sorsogon province, but on the south and southwestern portion of Bulusan volcano it does not exist. In nearly all of my previous explorations I have found it in wooded alpine or subalpine regions.

Alpinia congesta Elm. n. sp.

Loose tussocks. Stems severally scattered, 3 m. long, at least 2.5 cm. thick toward the base, terete, dark green, with an onion-like bulb at the base, ascending but the uppor two thirds recurved down hill. Leaves alternating every 7 to 15 cm., slightly descending, flat but margins wavy and recurved tips twisted, coriaceous or subchartaceous and heavy, lucid on the upper deeper green surface, glabrous, edges fringed with grayish white hairs, gradually tapering to the sharply and slenderly acuminate point, base broadly rounded, 3 to 4.5 dm. long by 14 to 18 cm. wide at or a trifle below the middle, lanceolately oblong, short petiolate, curing equally brown on both sides, rather smooth in the dry state; midvein very stout, deeply sunken above, beneath striate and with some scattering hairs along its side; lateral nerves more evident on the nether surface, oblique; petiole 2 to 3 cm. long, ascending, carinate below, widely caniculate above, sparsely hairy or subglabrous, 5 to 8 mm. thick; sheath also carinate, dark brown when dry, more or less hairy in the younger state, margins thinner and brownish in the fresh state; ligule erect, obtusely rounded at the apex, reddish brown, similar in vestiture on the outer side, 1 cm. long. Inflorescence terminal, erect, relatively small, subtended by foliaceous bracts, unbranched, upon a short peduncle, 15 to 25 cm. long; floral bunches alternatingly crowded from all sides of the rachis, sessile, ascending, 6 to 9 cm. long; bracts 5 cm. long in the flowering state, glabrous, 3.5 cm. wide across the middle, somewhat narrower at the base, the margins around the obtuse apex obscurely strigose, densely parallel veined, oblong, well enclosing the flower bundle, persistent, 8 cm. long in the fruiting state and becoming lacerated from the apex down to within a few cm. from the base; boot or inner bract 5 cm. long, striate, reddish tinged, becoming 2 or 3-lobed at the apex, margins of the obtuse lobes pubescent as well as the midrib on the back toward the top, also persistent; calyx shorter, striate, rigid, brown, spathaceous, glabrous except toward the top and the 2 or 3 apical teeth; pedicel 2 cm. long or less, glabrous, whitish; ovary more or less ciliate about the apical portion, otherwise glabrous, bright and yellow, bearing several linear glabrous clavate appendages 5 mm. in length; corolla creamy white; tube 3.5 cm. long when fully developed, glabrous, gradually thickened toward the top; lateral lobes spreading, oblong, at least 2 cm. long, one half as wide; lip 3 cm. long, narrowed toward the base, the lamina portion elliptically oblong, all glabrous; free portion of filament 1 cm. long, 4 mm. wide, glabrate, much compressed; anther linear, 1.75 cm. long, pulverulent on the back, 3 mm. wide, with a rounded crest at the apex, the cells bifid at both ends; style filiform, puberulent toward the thickened apex; stigma 3 mm. across the flattened portion, its rim minutely puberulent.

Type specimen number 16144, *A. D. E. Elmer*, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, May, 1916.

Discovered only a few clumps in damp soil of steep wooded slopes at 1500 feet altitude.

Primarily distinguished from *Alpinia elegans* (*Presl*) *K. Schum.* by its congested inflorescence and infrutescence, by the much stouter rachis, and by the sessile not pedicellate floral bundles which are arranged on all sides of the rachis rather than in two alternating rows.

Alpinia longipetiolata Elm. n. sp.

Rather few stemmed clusters. Stem green, terete, thickened at the base, less than 1.25 cm. thick, 1.75 m. high, leaflet bearing above the middle, erect from the base, recurved toward the top. Rhizome 1.25 cm. thick, short, also terete, occasionally branched, covered with brown bracts. Leaflets horizontal especially toward the twistingly recurved tips, pale green beneath, margins wavy, thinly coriaceous, in alternating rows 3 to 5 cm. apart, nearly flat, slightly paler green beneath, glabrous, oblong to searcely ovately oblong, obtuse or acute at the base, gradually tapering toward the sharply caudate point which is usually twisted, 20 to 30 cm. long without the petiole, 4 to 7 cm. wide across the middle or below it, edges not hairy; midrib stout, raised beneath, narrowly grooved above, glabrous, curing a lighter gray, fluted; lateral nerves numerous and faint, much ascending; petiole varying from 2 to 5 cm. long, rigid, suberect, in the dry state gray as the midvein, glabrous, obscurely expanded toward the distal end, green and caniculate along the upper side in the fresh state, also glabrous; sheaths easily becoming free from the stem, carinate, glabrous except at the base of the ligule which has vestiges of minute stellate hairs, the marcescent margin reddish brown; ligule interaxillary, 1 cm. long, wholly reddish brown, obtusely rounded at the apex, broad at the base and continuous with the sheath margins. Infrutescence ascendingly curved, green, the larger ones with few short alternating branches from near the base, 15 to 30 cm. long, the glabrous rachis turning reddish brown on the exposed side, terete, tough; the ascending buds and flowers cremeus except the yellowish green ovaries; fruit bearing branchlets scattered along the whole lenght in attenuate groups greatly varying in length up to 1 cm. and secundly short rebranched, persistent; base of the pedicels thickened and disk-like, usually grayish; young fruits lucid, deep green, globose, hard, the size of peas; calyx 1 cm. long, 3 mm. thick, tubular, glabrous, terminated by 3 obtusely rounded teeth, with 9 parallel veins, 3 conniventIy terminating into each tooth; corolla tube a trifle longer; the 3 lobes somewhat shorter, oblong, subequal, broadly rounded at the apex, membranous, also glabrous, each lobe with few faint nerves becoming reticulated toward the apex; lip thicker in texture, only 5 mm. long, divided through the middle, each half clawed toward the base, conspicuously bilobed for the upper one third; the median lobe linear, the lateral ones two to three times as wide and broadly rounded; staminode of a pair of rigid erect points 1.5 to 2 mm. in length, arising from the sinus of the filament base and that of the lip; filament 5 mm. long, flattened, fleshy, glabrous; anther nearly as long, widest across the emarginate apex, the linear cells along the edge of a fleshy base; filiform style glabrous as is also the infundibular stigma.

Type specimen numbers 16167 and 16954, *A. D. E. Elmer*, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, May and August respectively, 1916.

The first cited number was found in loose wet earth among stones of very steep and densely wooded gulches at 2000 feet altitude. Number 16954 has somewhat larger and longer petioled leaves which are frequently a trifle inequilateral, but otherwise it is apparently the same species. It was collected in woods along a ridge trail at a lower elevation.

While dissecting our flower side by side with Bureau of

Forestry number 4574 collected by *Mearns* and *Hutchinson* on mount Malindang, I noticed a big difference, not only in the specimens compared but also a difference in the flower of 4574 when compared with the description of *Alpinia flabellata Ridl.* who writes that the flower of his *Alpinia flabellata major* are the same as in the species. The lip of our specimen is entirely different than those on the type specimens of *Dr. Ridley's* species and variety.

Alpinia vulcanica Elm. n. sp.

Small few stemmed clumps. Stems unequal in length, closely connected and enlarged at the base, averaging 2 m. long, ascending and recurved toward the top, 1.5 cm. thick, very pale green and covered with shredded old sheaths, subcompressed toward the top; roots profuse, terete, rigid, 3 to 8 dm. long, yellowish brown, arising from the stem bases. Leaves above the middle or toward the distal end only, submembranous, nearly flat, ascending from the base, otherwise gracefully recurved, pleasing green but lighter beneath, the sharply acuminate tips recurved, glabrous, drying greenish brown, the larger ones 6 dm. long by 8 cm. wide across the middle, edges with a faint brownish line, base acute, gradually tapering toward both sides, distinctly petioled, linearly oblong; midvein very stout especially toward the base, stramineus when dry, carinate, sunken above, also glabrous; lateral nerves faint yet numerous, much ascending, straight; petiole 5 to 7 cm. in length, ascending, green, fluted and stramineus, deeply grooved and compressed on the upper side; sheaths tightly folding the stem except at the oblique throat, glabrate, strongly carinate, the narrow margin membranous and reddish brown; ligule similar in texture and color to the sheath margin, adnate and extended from the upper sheath margin along the edges of the basal portion of the petiole, 2 to 3 cm. long and lanceolately linear. Inflorescence terminal, ascendingly curved, rigid, 3.5 dm. long, spicate though larger ones may be few short branched toward the base, the basal one third flowerless; rachis 5 to 8 mm. thick, terete, pale or yellowish green, glabrous, flowers scattered along the under or outer side, upon few mm. long stout pedicels which are subtended by short but sharply pointed bracts; floral base obconic, 1.33 cm. high and nearly 1 cm. across the truncate apex, thick, isabellinus, composed of the thick transversely imbricated and persistent bracts, usually with 2 flowers of unequal development; calyx cup-shaped, subsessile, 5 to 8 mm. high, glabrous, subtruncate at the apex, distinctly parallel veined especially on the inner side, chartaceous; young corolla 12 mm. long, glabrous and minutely yellowish punctate, the basal 2 to 3 mm. united into a broad hyaline tube; the lateral lobes spreading, ultimately broadly elliptic, 1 cm. long and nearly as wide across the middle or immediately below it, obscurely parallel veined, apex obtuse; the corolla tube opposite the stamen, broader, truncately constricted at the base and with a hard granulate crest on the back toward the top; lip fleshy, erect, glabrous, as long as the lateral lobes, lanceolately linear, the edges obscurely rugose, punctate, terminated by a pair of small membranous lobes; stamen suberect, adnate to the corolla tube; free filament less than 5 mm. long, 3 mm. wide, also glabrous, fleshy; anther 12 mm. long, as wide as the filament, entirely glabrous or connective pulverulent, truncate at the apex, crestless; the 2 cells appearing bifid at both ends; dwarfed ovary glabrous but with an apparent hyaline rim surrounding it, obovoidly globose, rugose and hard, dark brown; style only a few mm. long, slender.

Type specimen number 16168, *A. D. E. Elmer*, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, May, 1916.

This remarkable plant was discovered at the upper edge of a high water fall, lodged upon the very end of the overhanging bed rocks of a very humid densely wooded gulch at 2000 feet altitude. It was the only plant I have seen during my six months exploration in this region.

It belongs to the sectiou of *Eubractea* and is the first *Alpinia* in this section reported from the Philippine Islands.

AMOMUM Linn.

Amomum conoideum (Ridl.) Elm. n. comb. *Hornstedtia conoidea Ridl.* in Leaf. Philip. Bot. II, 605, 1909.

Field note:—Stems in clusters, much ascending, .75 to 1 inch thick, terete, dull green, 5 yards long, at the base swollen to three times the thickness, connected with stout rhizomes; roots thick and wiry, yellowish, arising from the lower and lateral sides of the .5 to .75 inch thick dirty yellowish bract covered rootstocks; leaves alternating, ascending and narrower toward the distal end, divaricate, otherwise scattering and much reduced toward the base or one third the distance from the ground; midvein yellowish; blades submembranous, paler green beneath, edges more or less wrinkled, averaging 5 inches apart, in 2 alternating rows; cones terete, erect upon 3 to 5 inches long ascendingly curved and imbricately bracteate peduncle arising from the rhizome in the proximity of the stem base, 3 to 5 inches long, 2 to 3 inches across the middle, barely above ground; peduncle gradually thickened from the base toward the 4 inches long cone; bracts of the cone pointed, rigid, yellowish brown except the upper or exposed portion which is deep red; inner fruiting bracts pale green, even the persistent calyx, watery and partly decayed, giving off a slimy juice from the apex of the cone; carpels white, 1 inch long, angularly compressed, slightly hairy, narrowed toward the base; seeds numerous, covered with a fleshy white membrane.

Represented by number 16924, *Elmer*, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, August, 1916.

Collected in loose humus covered ground among thickets along the border of woods at 1000 feet altitude.

Both the types of *Hornstedtia conoidea Ridl.* and *Hornstedtia lophophora* of the same author were collected by the writer in the Cuernos mountains of southern Negros, the former in flower the latter in fruit. They are both rank large leafed plants, especially the latter, readily distinguishable from each other by the under glabrous leaf surface of *Amomum conoideum* (*Ridl.*) *Elm.* and by the soft or velvety nether leaf surface of *Amomum lophophora* (*Ridl.*) *Elm.* n. comb. (*Hornstedtia lophophora Ridl.* in Leaf. Philip. Bot. II, 607, 1909).

Amomum bulusanense Elm. n. sp.

Loose clumps. Stems several, ascending, terete, green, much and abruptly enlarged at the base, tips much recurved or reclining, 1.75 to 2.5 m. long, 1.5 cm. thick. Rhizome horizontal, subterete, hard, short, occasionally branched, yellowish. Leaflets horizontal or descending, bract like toward the base, chartaceous or nearly so, paler green beneath, margins wavy, apex quite abruptly acute to acuminate and recurved, obtuse to obtusely rounded at the unequally sided base, alternating every 7 cm., petioled, curing lighter brown beneath, the upper side more often greenish, glabrous, the narrow edge reddish brown and nearly hairless or ciliate toward the apex, oblong, 7 cm. wide, 3 dm. long; midvein ridged beneath, glabrous and smooth, lighter brown, grooved on the upper surface; lateral nerves straight, ascending, not visible on the upper side; petiole stout, 1.25 to 2 cm.

long, dark brown, glabrous, flat along the upper side; sheath strongly carinate, glabrous, overlapping, the sides clasping the stem, edges thinner but entirely hairless, the ridges cross barred at the petiole base; ligule .66 to 1 cm. long, interaxillary, erect, also glabrous, very rigid, about as broad, striate, apex obtuse to truncately rounded, apical margins thinner and usually deep reddish brown. Heads conically fusiform, 1.5 cm. thick by 5 cm. long, erect, terete, pointed, upon slender imbricated dirty brown bracteated peduncles arising from the rootstock; the outer or larger bracts 1.5 cm. wide at the base, nearly 4 cm. long, tapering from the base to the obtuse apex, striate, glabrous, closely imbricated, of a dull flesh red; bracteoles 4 cm. long, 5 to 8 mm. wide, glabrous, striate, margins subhyaline, widest and clasping toward the base, gradually tapering to the acute point; calyx 3.5 cm. long, slenderly tubular below the middle, subinflated above the middle, glabrous, obscurely striate, terminated into one or two acuminate points, the apical two thirds open on one side; corolla tube slenderly filiform, glabrate, nearly twice as long as the calyx; lateral lobes pink to white, 1.5 cm. long, oblong, hyaline, obscurely parallel veined, 5 mm. wide below the middle, glabrous, apex rounded; lip white and with a central portion, 2.25 cm. long, the basal one half slenderly clawed, the hyaline lamina portion ovately elliptic, veined and minutely or obscurely pale punctate, glabrous, the claw at the base with a pair of small appendages; filament extending 3 to 5 mm. above the calyx throat, fleshy, flattened, puberulent; anther 4 mm. long, widest across the truncately emarginate apex, glabrous, the cells widely parted toward the top; style very slender, glabrous except toward the enlarged stigmatic portion; fleshy stigma obovoidly capitate, glabrous or nearly so; ovary also glabrous. Carpels 2 cm. long, fully one half as thick, short ellipsoid and somewhat compressed, longitudinally costate, glabrous, sessile and rather broad at the base, at the apex truncately terminated by an elongated mucronate point, lacerating from the base toward the apex; seeds murinus, smooth, obscurely angular, 1.25 mm. across, numerous.

Type specimen number 16395, *A. D. E. Elmer*, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, April, 1916.

Discovered in rich wet humus covered ground of dense woods at 2000 feet altitude.

Related to *Amomum pubimarginatum Elm.* The leaves of 16395 are smaller, more greenish brown, less ciliate along the margins; flowers at least twice as long; ovary glabrous, not yellowish pubescent; fruit also glabrous, distinctly costate and whose apex is without any apiculations.

Amomum linearifolia Elm. n. sp.

Numerously stemmed clusters. Stems .75 cm. thick at the base, terete, erect at the enlarged bases, otherwise ascending, somewhat recurved toward the distal ends, dull green and quite rigid, 1 to 1.75 m. long. Rhizome as thick as the stem, dirty yellowish brown when young, bract covered; roots relatively thick and wiry, of the same color. Leaves in alternating rows, numerous although more scattering and bract-like toward the base, the basal leaflet only 2.5 cm. long, ascending, coriaceous, deeper green on the upper more or less folded surface, lucid above, margins reddish brown and obscurely rugose, glabrous, the edges very finely brown ciliate, petioled, linear, curing dark brown on the upper side, 2 cm. wide by 3 dm. in length, the acuminate tips usually twisted, subcuneate toward the base, drying brown; petiole 1 cm. long, rigid, caniculate along the upper side, glabrate, pale green but brown when dry; midvein paler brown, prominent beneath, nearly glabrous, faintly striate, deeply channelled above; lateral nerves fine, much ascending, more evident beneath; sheaths overlapping, becoming widely separated from the stem, smooth and glabrous but striate, narrow edge thinner; ligule 7.5 mm. long, erect, interaxillary, rigid, carinate except the margins, puberulent, obtuse and usually unequally bifid, more or less ciliate around the apical edge. Inflorescence cone-like, clustered about the stem bases and arising from the rhizomes, upon 3 to 8 cm. long stalks, elongately fusiform, in the fruiting state fusiformly ovoid, 4 cm. long, 1.25 to 2 cm. thick; peduncle slender, ascendingly curved, reddish brown bracteate, canescent or softly yellowish brown pubescent; its bracts clasping at the base, much reduced toward the base of the peduncle, the upper ones more scattering but much larger, tapering from the base to the apex, all canescent on the outside especially toward the base, carinate; outer floral bracts 2.5 cm. long, broadly lanceolate, gradually tapering to the acute apex, pubescent at the base and ciliate along the margins, striate, well clasping, fleshy red, chartaceous; bracteoles numerous, thinner, narrowly oblong, striate, more rounded at the apex and faintly pubescent; calyx also red except the tubular whitish base and glabrous except at the ovary, otherwise linearly fusiform, slenderly tapering to the slightly hairy tip or tips, involute; corolla glabrous, the basal one third tubular; lateral lobes hyaline, few parallel veined in the middle region, broadly rounded at the apex, basal one third of the lip clawed, the lamina broadly lanceolate or ovately elliptic and with conspicuous veins; filament strap-like, glabrous; anther bifid at both ends, crestless and entirely glabrous; style thread-like, smooth; stigma subcompressed, obconic; ovary subellipsoid, glabrous except the yellowish fringe of hairs around the top. Carpels 3 to 5, erect, 1.25 cm. long, flattened or angular on the inner compressed sides, shining purple above the middle, paler red beneath; seeds yellowish.

Type specimen number 16926, *A. D. E. Elmer*, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, August, 1916.

Collected in moist humus covered soil of jungles bordering woods at 1000 feet altitude.

Foliage distinct from *Amomum trilobum Ridl.* and from *Amomum loheri K. Schum.* Neither is it *Amomum warburgii K. Schum.* nor *Amomum deuteramomum* of the same author.

Amomum luzonense Elm. n. sp.

Several stemmed clumps. Stems 1.5 m. high, 1 cm. thick, thickened at the base, terete, glabrate, the basal one third leafless. Blades alternating every 3 to 5 cm., narrower toward the top, the basal ones broadened and relatively short, the average ones lanceolate, 3 cm. wide across the middle or widest portion, gradually tapering to the sharply acuminate apex, narrowed toward the sessile base, curing brown, edges glabrous as well as on both sides, 3 dm. long more or less, submembranous in the dry state; midvein prominent and lighter brown beneath, glabrate, sunken above, obscurely striate; lateral nerves strict, parallel, more evident beneath, much ascending; sheath glabrous, overlapping, loosely encircling the stem, carinate, smooth, with thin brown edges; ligule 5 mm. long, truncately rounded at the apex, dull brown in the dry state, erect, edges thinner but entire, more or less cross veiny on the outside toward the base, very oblique or unequal on the two sides. Infructescence arising from the roostocks; peduncle 5 cm. long, usually curved, somewhat hairy and bract covered; rachis yellowish brown pubescent; outer bracts 3.5 cm.

long by 1.5 cm. wide toward the base, striate from the middle toward the apex, subclasping the rachis, tapering toward the obtuse point, subhyaline edges ciliate in the early state, papyraceous, imbricated; fruit subglobose, 1.25 cm. across when dry, yellowish brown, canescent, sessile and irregularly subtended by dry more or less hairy bracts, longitudinally costate, apex of a small pubescent rim.

Type specimen number 15645, *A. D. E. Elmer*, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, June, 1916.

Collected it in well drained ground of secondary woods or shrubberies. Rare in our locality.

Apparently related to *Amomum deuteramomum K. Schum.*

COSTUS Linn.

Costus speciosus (Koenig.) Sm.

Field-note:—In thickets of humid woods at 2000 feet altitude and in wet humus covered ground. Stem erect from the base, nearly horizontal toward the top and usually spirally curved, herbaceous and green, terete, 3 to 5 feet high; leaves alternating, chiefly toward the top, mostly arranged along the outer side of the stem curve, horizontal or descending, much paler green beneath, entirely glabrous; heads terminal, 2 inches across or smaller, solid; corolla white but yellowish tinged in the throat, odorless, erect from the base but curved toward the wide throat, membranous; stamens cremeus; style similar in color but stigma green; the rigid calyx boot deep red; the young greenish but turning reddish in the mature state; seeds murinus.

Represented by number 14707, *Elmer*, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, October, 1915.

White corollas very showy as well as the wine red fruiting heads.

CURCUMA Linn.

Curcuma zeodaeria Rosc.

Represented by number 16738, *Elmer*, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, July, 1916.

GLOBBA Linn.

Globba parviflora Presl

Field-note for 15381:—Very common in shady places along borders of shrubberies and in open places of hills up to 3000 feet altitude. Stems soft in texture, usually many and clustered, slender, ascending or the central ones erect, terete, green, averaging 2 feet high; leaves membranous, much lighter green beneath, nearly flat, chiefly horizontal; terminal inflorescence usually erect; flowers delicate, whitish, odorless, the stalks green; carpels green, more or les longitudinally carinate.

Represented by numbers 15666 and 15381, *Elmer*, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, December, 1915.

Exceedingly common and its punctate bracts and flowers are typical of *Presl's* species collected by *Haenke* in this same province. *Dr. Ridley* notes the flowers as yellow, but ours were white or nearly so.

HEDYCHIUM Koenig.

Hedychium coronarium Koenig.

Field-note:—Cultivated and growing in dense masses along a water drain in the town of Irosin at 750 feet altitude. Stems erect, .5 inch thick, subterete, green, 1.5 yards high; leaves numerous, alternating every 2 inches, ascending, coriaceous, much paler green beneath, the sides somewhat recurved; terminal inflorescence erect, terete, green except the corollas and loosely bracteated; buds erect, cremeus; petals pure white, spreading and recurved; the flowers very showy and exceedingly fragrant.

Represented by number 16434, *Elmer*, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, June, 1916.

Not common in the provinces, and deserves to be more extensively cultivated for its beauty and fragrance.

Hedychium mindanaense Elm.

Field-note:—Solitary or in small tufts, mainly upon the lower limbs of trees at 1000 feet altitude and in humid woods. Stems ascending; coriaceous leaves much paler green beneath; capsule hard, shining, green, red when mature.

Represented by number 15908, *Elmer*, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, April, 1916.

The size and color of the flower are as described in the original description, and in other respects it seems typical *Hedychium mindanaense Elm.* rather than *Hedychium philippinense K. Schum.* of Jolo.

HORNSTEDTIA Retz.

Hornstedtia lepicarpa (**Ridl.**) **Elm.** n. comb. *Amomum lepicarpum Ridl.* in Leaf. Philip. Bot. II, 604, 1909.

Represented by number 17176, *Elmer*, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, September, 1916.

Hornstedtia pubescens (**Ridl.**) **Elm.** n. comb. *Amomum lepicarpa pubescens Ridl.* in Leaf. Philip. Bot. II, 604, 1909.

In my opinion it quite deserves specific rank by reason of its being a much larger plant, coupled with numerous other specific characters. The flower and fruit belongs to *Hornstedtia* rather than to *Amomum*.

Hornstedtia pandanicarpa (**Elm.**) **Elm.** n. comb. *Amomum pandanicarpum Elm.* Leaf. Philip. Bot. VIII, 2899, 1915.

Field-note for 16755:—Scattering clump in wet stony ground on very steep densely shaded gulches at 1500 feet altitude near a stream. Stems numerous, erect and ascending or almost horizontally hanging from the nearly precipitous slopes, 10 to 15 feet long, stout, nearly straight clear to the top, 1.25 inch thick, terete, reddish brown toward the 3 inches thick base, otherwise pale green; rhizome stout, .75 inch thick, dirty yellowish bracteate, connecting the stem bases; leaflets ascending or spreading horizontally, coriaceous, coarsely undulate along the margins, deeply folded thereby exposing the much lighter green nether surface, alternating every 3 to 4 inches, much scattered toward the base and much reduced; flowering head cylindric, from the rhizome, 3 inches high, more than the basal one half covered with dirty white and purplish red tipped erect bracts, the upper portion with the erect flowers; peduncle 5 to 8 inches long, ascendingly curved, .5 inch thick, dirty white bracteate, appearing thicker toward the head; flowers numerous, coming into anthesis in circles from the circumference to the center, the boot red, the corolla tip and margins yellow, otherwise whitish; anther crown deep red as is also the stigma.

Represented by numbers 16755 and 16223, *Elmer*, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, June and July respectively, 1916.

Hornstedtia propinqua (**Ridl.**) **Elm.** n. comb. *Amomum propinquum Ridl.* in Govt. Lab. Publ. XXXV, 84, 1905.

Field-note for 15900:—Tufts in wet gravelly earth of very steep densely wooded ravines at 1000 feet altitude. Stems few to several, bulbose at the base, ascending from the ground, otherwise much recurved, .5 inch thick, terete, dark green, 5 to 8 feet long, the upper two thirds leaf bearing; blades darker green above, flat but wavy edges, tips much recurved, coriaceous, reduced and scattering toward the base; flower cluster from the rhizome near the stem base; stalk subcompressed, red, its fleshy bracts whitish; flowers several or more, succulent, the boot reddish tinged; corolla yellowish white or white and with a yellow center and purplish spotted, the lateral appendages of the staminode broad; fruit nearly 1 inch long, purplish black, prickly.

Represented by numbers 15614 and 15900, *Elmer*, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, December 1915, and April 1916 respectively.

In May, 1904 I collected at Baguio flowering clusters of a *Zingiberaceous* plant under number 6284 and upon which *Dr. Ridley* founded his species *Amomum propinquum*. A month earlier *Dr. Copeland* also collected typical flowering specimens without leaves at Davao under his number 843. Since then no flowering specimens were collected. In the genus covers of the Bureau of Science are two leafy specimens determined by *Ridley* as *Amomum propinquum*—namely 2866 *Williams* from Davao and 7664 *Elmer* from Lucban. Neither of these sheets are *Amomum propinquum Ridl.*, but rather represent *Amomum muricarpum Elm.* Under the same covers are eight other sheets with flowers only, and which appear to be a saprophytic species of *Orobanchaceae*. The type sheet of *Hornstedtia philippinensis Ridl.* or *Clark* 1704 from Masbate contains the fruit of *Amomum propinquum Ridl.* *Hornstedtia propinqua* (*Ridl.*) *Elm.* has different flowers, narrower leaves and entirely too long stipules to be classed with *Hornstedtia muricarpa* (*Elm.*) *Elm.* n. comb. (*Amomum muricarpum Elm.* Leaf. Philip. Bot. VIII, 2896, 1915).

Hornstedtia philippinensis Ridl.

Field-note:—Rank and scattering perennials, in wet more or less compact soil of light woods at 750 feet altitude facing the Pacific ocean. Rhizome long, few to several from each of the bulbose stem bases, terete, horizontal, tough, rebranched, .5 to .75 inch thick, yellowish; stem erect, terete, dull green, with a much enlarged base, mostly above ground, 15 feet long, the basal one half leafless, the upper part ascending or even recurved toward the distal end; leaves alternatingly spreading every 3 to 5 inches, ascending or horizontal, quite rigid, chartaceous, margins coarsely rugose, much paler beneath, nearly flat, only the tips abruptly recurved, scattering and much reduced toward the base; flower cluster from the rhizomes, erect, crimson red except the whitish inner bracts which are covered and subtended by dirty yellowish under ground ones, triangularly terete, upon 3 to 5 or even 8 inches long rather thin and yellowish brown bracteate stalks arising from the rhizomes some distance from the bulbose base of the stems; fruiting heads subglobose, 2 to 3 inches across, underground, cremeus but with a faint or dull reddish tinge; carpels hard, obovoidly globose, with irregular sides, 1 inch across, the outer side occasionally with blunt excrescences but usually smooth; seeds numerous, blackish brown, with a thin white meat covering, arranged in 3 cells.

Represented by number 16713, *Elmer*, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, July, 1916.

In my last article of this publication the fruit of this species was reported as unknown. Being in a field where many flowering specimens were noticed, I made a special effort to find the fruits also. Mere raking off the humus layer is not sufficient to reveal them. In the present instance, my companion and I pried the plants up by the roots and found the nearly ripe fruit clusters all underground, some of them six inches below the surface of the soil. The flowering clusters were above ground partly covered with a humus layer and some distance from the base of the stems, while the fruiting heads were nearly always found clustered near the stem bases and well below the ground surface.

Hornstedtia irosinensis Elm. n. sp.

Perennial herbs. Stems ascending or erect, slightly curved toward the top, less than a meter in length, evenly scattered, terete, as thick as an ordinary lead pencil, green, thickened at the bright red base. Rhizome rigid, horizontal and branched, slender, whitish though covered with reddish bracts, as thick as a slate pencil; roots wiry, yellowish white. Leaves ascending or horizontal, much reduced toward the base, submembranous, flat except the wavy margins, tips recurved, slightly paler green beneath, much narrower toward the top, the normal ones linear lanceolate, glabrous above, beneath puberulent, petioled, edges without hairs, gradually tapering to the sharply acuminate apex, base obtuse to subcuneate, 2 cm. wide more or less, 20 to 25 cm. long, arranged in alternating rows 2 to 3 cm. apart, rather numerous, curing grayish green; midrib pronounced beneath, light brown when dry, striate and pubescent beneath, sunken and glabrous above; lateral nerves numerous, quite evident beneath; ligule interaxillary, erect, dirty brown, rigid, glabrate, 2 to 3 mm. long, obtusely rounded at the apex, frequently inequilaterally bifid; petiole .33 to .66 mm. long, stout, ridged below, upper side sunken, ascending; sheaths overlapping, carinate, sides clasping the stem, edges thinner but not ciliate, glabrate or dirty puberulent. Inflorescence erect and barely above the humus covered ground, from the rootstocks; peduncle very slender, subhorizontal, abruptly curved toward the flower bearing tips, its young bracts pink; flowers few to severally clustered, but only one in anthesis at the same time; rachis densely yellowish pubescent; flowers erect, loosely clustered; their subtending bracts 5 mm. wide, nearly 2 cm. long, subhyaline, faintly parallel veined, oblong, obtusely rounded at the apex, minutely punctate and pubescent at the base; calyx cylindric, fully 2 cm. long, minutely punctate, glabrous even the bifid or unequally 3-toothed apex; corolla tube a trifle longer than the calyx, punctate; lobes 2.5 cm. long, oblong, hyaline, nearly 5 mm. wide, spreading, parallel veined, obtuse at the apex, densely black punctate, somewhat unequal; lip reaching 3 cm. in length, suberect, oblong, 12 mm. wide above the middle, narrowed toward the base where there is a pair of narrow appendages 8 mm. in length, hyaline, minutely punctate, numerously parallel veined especially in the middle region, apex obtusely rounded and occasionally bearing a blunt point, usually inflexed, entirely glabrous; filament ribbon-like, fleshy, glabrate; anther cells linear, 2.5 mm. long, relatively wide, bifid at both ends, pulverulent on the back, 3-lobed at the apex; lateral lobules linear to spathulate, 6 mm. long, punctate, 1.5 mm wide, divaricate and curved; middle lobule erect, similarly punctate and hyaline, elliptically rounded, 5 mm. across; style filiform, glabrous, terminated by an obconic stigma; ovary pubescent, short pedicelled, bearing a pair of erect fleshy glabrous appendages 5 mm. in length. Fruits few at the distal end of the infrutescence, dark red, globose to subellipsoid, the larger ones 1.25 cm. in diameter, conspicuously papillate especially toward the apex, above ground but beneath the humus covering, obscurely costate, subsessile, bluntly mucronate at the top, usually puberulent toward the distal end; seeds numurous, angular, obscurely pitted.

Type specimen numbers 16263 and 16832, *A. D. E. Elmer*, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, June and August respectively, 1916.

Both of these numbers were found in moist compact and well drained ground of open woods along ridges at 1250 feet altitude. The fresh fruits reminded me of wild strawberries.

No doubt nearest to *Hornstedtia microcheila Ridl.*, but our leaflets average larger and curing grayish green; inflorescence nearly glabrous or at least nowhere so densely matted as on *Ridley's* species, whose persistent calyx base in the young fruit is densely pubescent and whose teeth are also hairy; lip quite different and sheaths glabrous, not stellately pubescent. By mistake our numbers were sent out as *Hornstedtia luzonensis Elm.*

Hornstedtia peninsula Elm. n. sp.

Scattering clusters. Stem suberect from the base but soon reclining down hill, terete, pale green, 1.25 cm. thick toward the slightly enlarged base, 1.5 to 2.5 m. long, leaf bearing from the middle. Rhizome slender, branched occasionally, terete, 1.25 cm. thick, pale green except the brown scales, long; roots wiry, brown. Leaflets alternatingly scattering, descending, recurved at the tips, deeply folded, very dark green above, paler beneath, subcoriaceous, much scattering and bract-like toward the base, the hairless margins more or less wavy, glabrous, sessile, curing unequally brown on the sides, linear, 3 cm. long more or less, 1.75 cm. wide, conduplicately compressed, usually somewhat curved, very slenderly tapering towards the flagellately pointed apex, base attenuate; midrib straw brown, bold beneath, sunken above, glabrous, striate yet smooth; lateral nerves nearly parallel, more evident on the nether side; sheaths compressed and overlapping, pale brown or stramineus, smooth, occasionally subglaucous, carinate, minutely purplish spotted or obscurely pustulate on the inner side, the side toward the edges quite thin; ligule very rigid, erect, interaxillary, about 5 mm. long, deep purplish brown, obtusely rounded, in the dry state subglaucous. Peduncles slender and very pale green, alternatingly scattered along the rhizomes, ascendingly curved, 3 to 5 cm. long or longer, imbricately bracteate; bracts board and clasping at the base, membranous, much shorter toward the base, dirty yellowish, glabrate, obtuse or becoming irregularly cut at the apex, glandularly punctate or purplish spotted. Heads erect, with watery white bracts, not numerously flowered; subtending bracteoles hyaline, 12 mm. long, irregularly truncate at the apex; calyx 2 cm. long, glabrous, minutely punctate, subinflated, terminated by 2 to 3 blunt teeth; corolla tube 3.5 cm. long, punctate and glabrous, terminated by lateral hyaline oblong lobes which are 1.5 cm. long by 4 mm. wide; lip 1.5 to 2 cm. long, broadly lanceolate to oblong, striate and similarly punctate, folded upon the ventral side, thin or subhyaline; filament ribbon-like, 8 mm. long above the corolla lobes, glabrous and punctate; anther 12 mm. long, 2 mm. wide, linear, widest across the apex; the brown connective granular, terminated apparently by a 3 linearly lobed crest; pedicel of the glabrous ovary short. Fruits sessile, globosely ellipsoid, less than 1.5 cm. in length, yellowish strigose, apex very bluntly pointed, longitudinally ridged and soft muricate all over, greenish on the exposed sides; young seeds irregularly angular, finally rather smooth.

Type specimen number 16455, *A. D. E. Elmer*, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, June, 1916.

Discovered in wet stony ground of herbaceous thickets in a densely shaded gully between forested ridges at 1750 feet altitude.

This species grew in the same ground mixed with *Hornstedtia irosinensis Elm.* number 16832. Its flowers and fruits are very similar, yet its taller habit and much longer leaves at once distinguished it in the field.

Hornstedtia purpurea Elm. n. sp.

Tussocks. Stems 1.5 to 2.5 cm. thick, terete, varying in length from 1 to nearly 3 m., ascending, nearly straight clear to the distal ends, pale green except the red more or less enlarged base. Rootstock 1.25 cm. thick, connecting one stem base with the other, red bracteate when young, yellowish when old, with numerous wiry and dirty yellow roots. Blades ascending, strongly folded upon the upper dull green surface, rigidly coriaceous, the edges smooth except toward the apex where they are only sparsely ciliate, sides wavy, in alternating rows 7.5 cm. apart, in the dry state greenish, gray above and dirty castaneus beneath, widely separated and much reduced toward the base, glabrous, the whole of the under surface atropurpureus or the young ones lighter purple, oblong, base obtuse, apex quite abruptly acute, the average ones 4.5 dm. long by 9 cm. wide caross the middle, appearing minutely pustulate on the nether side, short petioled or subsessile; midrib purple even on the upper more or less carinate side, very strongly carinate beneath, glabrous; lateral nerves much ascending, straight, slightly more evident on the lower side; petiole 1 cm. long, carinate and glabrate beneath, caniculate above; sheath glabrate or pulverulent, the edges membranous, two thirds clasping the stem; ligular stipule projected from the upper end of the sheath sides, submembranous except at the basal portion, oblong, striate or obscurely carinate, obliquely obtuse at the apex, 2 cm. long by 7 mm. wide. Infrutescence subglobose, 5 to 8 cm. across, upon a 2 cm. thick red bracteate ascendingly curved peduncle arising from the rhizome near the stem base; carpels subsessile or upon short thick pedicels, subtended by unequal persistent oblong reddish bracts, hard, dull red, 2.5 cm. long by 1.5 cm. thick, angular and tapering toward the base, obscurely costate, short yellowish canescent, terminated by a large stout calyx portion, the apical part very irregularly excrescent or ridged and bluntly muricate; seeds 2 mm. across, angular, blackish brown, smooth.

Type specimen numbers 16819 and 17023, *A. D. E. Elmer*, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, August, 1916.

Confined to moist stony earth of steep densely wooded and shaded cuts or gulches near the water courses at 1500 feet altitude.

Allied to *Hornstedtia pandanicarpa* (*Elm.*) *Elm.* which has a thick rim about the apical portion of its carpels, and whose ligular stipules are entirely different. Our present new species is unique in its purple to atropurpureus nether leaf surface. The author has observed a number of these plants clinging to almost precipitous slopes, and all leaves of whatever age are colored beneath. Looking up from the creek bed they appear gorgeous, but looking down upon them from above the coloration can not be detected.

Hornstedtia sorsogonensis Elm. n. sp.

Coarsely clustered perennial. Stems 2.5 cm. thick, terete, 4 m. long, ascending, 2 to 3 times as thick at the en, larged base, connected with rhizomes. Roots dirty yellow-wiry and rigid, from the lower side of the rootstocks and bulbose stem bases; rhizome stout, horizontal, 1.25 to 2 cm. thick, yellowish brown bracteated. Blades chiefly ascending, closer set and narrower toward the top, scattering and much reduced below the middle and toward the base, in 2 alternating rows, 7 to 12 cm. apart, conduplicate, coriaceous, lighter green beneath, the brown densely ciliate margins wavy and in the dry state much wrinkled, glabrous, otherwise curing dull brown, oblong, 5 to 6 dm. long by 9 to 12 cm. wide, subsessile, obtuse toward the apex and terminated by a more or less twisted short acuminate point, base obtuse; midrib very stout and pronounced beneath, grooved above, also glabrous, straw brown when dry, smooth except toward the carinate and obscurely pustulate base; sheath overlapping and clasping the stem, glabrous except at the ligular region, strongly carinate and with cross bars toward the top, giving it a reticulate appearance; ligule interaxillary, erect, stout and rigid, densely rufous pubescent on the back and at the connection with the petiole and sheath, obtusely rounded at the apex, less than 1 cm. in length. Peduncle arising from the rhizomes near the stems, 8 to 20 cm. long, not rigid though subligneous, subterete, yellowish white and covered with yellowish brown bracts, less than 1.25 cm. thick, ascendingly curved, only a trifle thicker at the distal end; flowering head elongated; the individual flowers erect, the upper one half deep purple, whitish toward the bract encircled base; outer bracts glabrate, strongly carinate, imbricate, the basal ones much shorter and abruptly acute at the apex, the upper ones oblong but the apex more gradually acuminate, all chartaceous; bracteole 2 to 3 cm. long, loosely enclosing the flower, glabrate, parallel veined though somewhat reticulated toward the apex, cleft in 2 blunt oblong teeth toward the tip; calyx broad, oblong, erect, 4 cm. long by 1.5 cm. wide above the middle, 7.5 mm. wide at the base, distinctly parallel veined, glabrous, slit open toward the apex, terminated by 3 rather narrowly acuminate teeth, each tooth bearing an ascendingly curved point from the dorsal side, points with apical teeth glabrous or in the early stage bearing a faint brush of hairs; corolla 4.5 cm. long, the basal two thirds tubular, striate and glabrous; the 3 segments at least 1.5 cm. long, oblong, 5 mm. wide, apex truncately rounded and emarginate, primarily with 3 parallel veins in the middle portion, all straight, the central one extending to the emargination, the lateral ones becoming reticulate at their distal ends, entirely glabrous; lip a trifle longer, broadly lanceolate in general outline, the basal portion cuneate, nearly 1.5 cm. wide below the middle, profusely veined, the middle linear region thicker than the marginal sides, the margins above the widest portion conspicuously ruffled clear to the much extended apex, glabrous on both sides; filament succulent, strap-like, the distal portion slightly pubescent, little longer than the corolla tube, parallel veined; anther connective thick and hard, curved dorsally, glabrous, truncate, broad and deeply notched at the apex, not crested nor hairy; anther cells 7.5 mm. long, curved ventrally, glabrous, parallel except at the more or less divergent ends; style filamentous, glabrous, thickened toward the stigma which is short obconic, somewhat flattened and glabrous; ovary densely hairy with a pair of glabrous erect 4 mm. long by 1 mm. wide compressed appendages. Fruiting head subglobose, 8 cm. in diameter, dirty yellowish bracteated about the base; carpels yellowish red or subroseus, sessile, contiguous and forming a solid mass, obconic in outline, the smooth sides irregular and ridged, sessile, 3 to 4 cm. long when dry, 2.5 cm. across the top or widest portion, tapering from the small base, the top portion or side excrescently ridged about the short blunt calyx point, tawny appressed pubescent all over; seeds murinus, 3 mm. across, angularly rounded, smooth or obscurely rugose.

Type specimen number 16925, *A. D. E. Elmer*, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, August, 1916.

Collected in loose humus covered damp soil of thickets along borders of woods at 1000 feet altitude. Rare!

Related to *Hornstedtia pandanicarpa (Elm.) Elm.*, yet distinguishable by either the fruits or flowers. Carpels of *Hornstedtia sorsogonensis Elm.* are very irregularly and rugosely ridged, not forming a thick continuous rim about the apex; and the floral bract is much broaded and glabrate.

Hornstedtia subviridis Elm. n. sp.

Dense tussocks. Stems erect, at least 1.25 cm. thick, terete, 1.75 to 2.75 m. high, much recurved toward the tips, pale green, sublucid, bulbose at their bases. Leaflets numerous, 3 to 5 cm. apart, in two alternating rows, reduced and scattering toward the base, more numerous and narrower toward the distal ends, ascending except those at the top, flat, chartaceous, only a trifle paler green beneath, curing subviridus on both sides, petioled, glabrous, the narrow brown line along the edges densely ciliate, narrowly oblong, apex gradually acuminate, base subinequilaterally obtuse, the larger ones 6 cm. wide, 4 to 5 dm. long; midrib pale brown, smooth, glabrous, prominently ridged beneath, deeply sunken above; petiole

1 cm. long more or less, stout, broadly channelled on the upper side, also glabrous, lateral nerves very numerous and very faint; sheath wholly glabrous, carinate, clasping the stem, oblique toward the top, margins dull reddish brown and thinner; ligule shorter than the petiole, erect and interaxillary, broad, obtusely rounded at the apex, dull brown in the dry state, margins and apical border much thinner. Infrutescence short ellipsoid, arising from the rootstocks; its peduncle curved, 7.5 cm. long, very tough, thicker and more bracteate toward the top, entirely yellowish white; rachis bracts 2 cm. long, numerously veined, linearly oblong, pubescent especially along the back, 3 mm. wide or wider, acute at the apex; floral bracts as long, narrowly oblong, gradually tapering to the acute apex, sparsely strigose toward the base on the dorsal side; boot parallel veined, 1.5 cm. long, hairy, acutely bifid at the apex; calyx narrowly tubular, 3 cm. long, the exposed portion puberulent, striate, minutely 3-toothed or pointed; corolla much exceeding the calyx, very slender, glabrous, apparently with a lateral pair of oblanceolate lobes; lip obovate in general outline, erect and exceeding the anther, broadly 3-lobulate, the middle lobule largest; anther 1 cm. long, thickest across the truncate apex which usually bears a fringe of fine hairs but which is crestless; pedicel 5 mm. long, densely hairy as is also the ovary; style very thread-like, glabrous except toward to top; stigma capitate, usually somewhat hairy at the margin. Carpel 1.5 cm. long, obovoidly globose, muricate above the middle, both ends similarly tapering, bearing an erect rigid calyx boot from the apex, the basal portion extended into a 1.25 cm. long fulvous pubescent pedicel provided with a pair or a whorl of 3 elongated bracts, more or less appressed brown pubescent especially at the ends; seeds 3 mm. across, angularly compressed, blackish brown, nearly smooth.

Type specimen number 16437, *A. D. E. Elmer*, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, June, 1916.

Only one clump was seen on a well drained stony incline among jungled woods at 1000 feet altitude.

Having found only withered flowers I was unable to match it carefully with *Amomum lepicarpa Ridl.* Our plant is critically related to *Ridley's* species but it is much smaller, has smaller leaves besides having some minor fruit differences. See *Elmer* 17176 which was collected in this same region, and which is being distributed under *Hornstedtia lepicarpa (Ridl.) Elm.*

PLAGIOSTACHYS Ridl.

Plagiostachys philippinensis Ridl.

Field-note:—Small clusters in fertile moist humus covered ground of dense woods at 1000 feet altitude. Stems 3 to 5 feet long, deep green, terete, .5 inch thick, enlarged at the base, 3 to 5 in a cluster; leaves ascending, submembranous, the basal ones much reduced and scattering, the largest ones terminal, margins straight, paler beneath, with reddish ligules and sheath margins; inflorescence arising on the stem one foot above ground or below the lowermost leaflet, ascending, 3 to 5 inches long, few short branched from the base, rigid, covered with dirty rotten bracts; buds whitish, flower pink; the short ovoid fruits green.

Represented by number 16215, *Elmer*, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, May, 1916.

Plagiostachys ridleyi Elm.

Field-note for 16607:—Rather large clumps in wet black ground among secondary forests at 1000 feet altitude and facing the Pacific ocean. Rhizome short, rebranched, hard and tough, .5 inch thick, yellowish; stems several, ascending, enlarged at the base, .75 inch thick, terete, green, 6 to 10 feet high, the basal one yard leafless; blades ascending, tips abruptly recurved, coriaceous. lighter green beneath, midrib yellowish beneath, 3 to 7 inches apart, the uppermost closer set and much narrower; inflorescence lateral, 6 inches long, about a yard above ground and beneath the foliage, usually 3 branched from near the base, erect, the thick terete rachis greenish; flowers whitish yet tinged with red, succulent, the old ones forming wet rotten masses; fruits dark green, ellipsoidly globose, about .5 inch thick.

Represented by numbers 15279 and 16607, *Elmer*, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, December 1915 and July 1916 respectively.

Plagiostachys escritorii Elm.

Field-note for 16216:—Dense tussocks in wet humus covered fertile soil or in densely wooded or forested flats at 1000 feet altitude. Stems several to numerous, ascending, 5 feet long, 1 inch thick at the base, terete, green; leaves ascending or horizontal, the much reduced blades one third above the ground and much scattering, the terminal ones narrower, thinly coriaceous, much darker green above, tips abruptly recurved, margins wavy; fruit cluster upon the basal and outer side of the stems, erect, 3 to 5 inches long, usually few short branched from the base; fruits ellipsoid or fusiformly ellipsoid, obscurely compressed, .5 to .75 inch long, dirty yellowish or when exposed becoming reddish tinged, covered by rotten bracts and old foliage.

Represented by numbers 16216 and 16062, *Elmer*, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, May, 1916.

Frequently observed along damp wooded ridges of the subalpine hills facing the Pacific ocean. More recently it was again collected on mount Maquiling. So far its known distribution is along the Pacific from Luzon to Mindanao.

VANOVERBERGIA Merr.

Vanoverbergia sepulchrei Merr.

Field-note for 17095:—Large dense tussocks in wet more or less stony ground of very steep densely wooded slopes dipping into precipitous canyons at 3000 feet altitude. Stems ascending, terete, 1 inch thick, 10 to 15 feet long, leaf bearing from the middle, enlarged at the base and red bracteate; leaflets horizontal or descending, coriaceous, nearly flat except the twisted tail-like tips, dull green above, slightly paler beneath, the midrib yellowish brown or red, margins rugulose toward the apex, in alternating rows 3 inches apart, the lower ones much reduced; sheaths green or when old grayish white, the ligule deep or dull red; the spike-like inflorescence terminal, recurved, 1.5 foot long; peduncle terete, it as well as the rachis deep red or when young pink; pedicels pale pink; young bud bracts brownish and with pink tips, soon turning dry and subpersistent; ovary deep red; corolla bud erect, terete, pale white or with sulphureus tips; the coriaceous corrolla and inner floral organs soon perishing and forming an intermixed watery rotten mass with the subtending bracts and sheaths; fruit ellipsoid or subglobose, at most .5 inch thick, obovoid when young, deep wine red, more or less hidden by the old nearly decayed floral parts; seeds numerous, whitish, in a conglomerate mass.

Represented by numbers 17095 and 17383, *Elmer*, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, August and September respectively, 1916.

A coarse alpine plant in very humid almost inaccessible places. Quite variable and apparently nearest related to *Alpinia pendula Ridl.* So far not known outside of Luzon. The second species of the genus I now consider *Alpinia diversifolia* (*Elm.*) *Elm.* n. comb. (*Vanoverbergia diversifolium Elm.* Leaf. Philip. Bot. VIII, 2913, 1915.)

ZINGIBER Adan.

Zingiber officinale Rosc.

Represented by number 17417, *Elmer*, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, September, 1916.

This species has been repeatedly observed in cultivation but only once was it seen with floral heads. Its rhizome is extensively used by the natives who call it "Luya".

Zingiber sylvatica Elm.

Field-note for 14992:—In wet earth upon a large bowlder of densely wooded stream banks at 1500 feet altitude. Stem severally clustered, ascending from the base, strongly recurved so that the apical portion usually rests upon other herbs or upon the ground and forming nodules of individual plantlets, terete, as thick as a lead pencil, dull green except the slightly reddish brown bracts, 3 to 5 feet long, the basal one fourth leafless; the coriaceous leaflets horizontal or descending, flat except the recurved tips, much lighter green beneath, gradually reduced toward the very slender distal end of the stem; inflorescence few to several, erect, arising from the rhizomes, upon 6 inches long pale green terete though bracteate peduncles; heads pale green, generally terete, 1 inch thick throughout, 3 to 5 inches long, only the bract margins and tips brownish tinged, the apical portion of the imbricating bracts curved upon the ventral side; flower odorless, pale yellow throughout except the watery white basal portion; floral bract 3.5 cm. long, oblong, 8 mm. wide across the middle or below it, subacute at the apex, rather broad at the base, glabrous, hyaline, striate, purplish spotted along the margin toward the apex; calyx 1.5 cm. long, white below, greenish above the middle, hyaline, spathaceous, few parallel veined and purple spotted, apex truncate or obscurely bidendate; corolla 4.5 cm. long including the lobes, the basal one half slenderly tubular though gradually becoming thickened toward the lobes, glabrous, flaccid, hyaline, similarly veined and spotted; the lobes lanceolate, few veined and spotted, otherwise hyaline, gradually tapering to the acute apex, the middle one much longer and usually curved; anther cremeus, 1 cm. long, narrowly elliptic, glabrous, terminated with a long slender recurved mottled beak the tip of which is recurved; style very fine, extended through the anther beak, terminated by an expanded ciliated stigma; ovary glabrous, compressed, having a few yellowish glabrous erect short appendages.

Represented by numbers 14992 and 14936, *Elmer*, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, November, 1915.

A weak more or less sprawling or reclining species, quite commonly met here in wet earth of deeply shaded ravines or along water courses at 1500 feet altitude. The younger heads are greenish, only the bract margins reddish brown tinged, turning flame red upon maturity.

Zingiber zerumbet magnum Elm. n. var.

Dense patches. Stems 1 to 2 m. high, 1.25 cm. thick, dark green, numerous, erect, subterete. Leaves ascending or divaricate, paler beneath, more numerous at the top, reduced and scattered toward the base, the sides pendant, thinly coriaceous, sublucid above, alternating every 4 to 6 cm., oblong, curing brown, glabrous, the edges very faintly brown, gradually and acuminately pointed at the apex, cuneate toward the sessile base, margins along the base recurved, oblong to broadly oblanceolate, 20 to 35 cm. long, 5 to 7 cm. wide at the middle or a trifle above it; midrib stout especially toward the base, paler brown when dry, glabrate beneath, fluted; sheath well separated from the stem toward the throat, otherwise tightly enclosing it, glabrate or only sparsely hairy especially in the region of the ligule, striate, edges thin and hyaline; interaxillary stipule or ligule erect, clasping the stem, smooth and glabrate, hyaline margined, the obtuse apex becoming lacerated, 3 cm. long. Peduncle 20 to 30 cm. long, erect, terete, green, striate, provided with alternating bracts, the upper portion of the bracts free, hyaline margined, carinate, subinflated, tightly clasping the peduncle toward the base, glabrate or sparsely hairy, broadly obtuse at the apex. Heads ovoidly ellipsoid, 10 to 15 cm. long, very watery and heavy; outer bracts totally dark green, only the older ones brown margined around the apex, 3.25 cm. long by 2.5 cm. wide across the broadly rounded apex, margins hyaline, apical portion atropurpureus spotted, glabrous, numerously and parallel veined, the inner side purplish striate, obovately oblong, the basal ones usually somewhat larger and the apical ones smaller; bracteole 2.5 cm. long, hyaline and glabrous, enveloping the flower, faintly veined, purplish spotted toward the obtuse apex, 8 mm. wide, broad at the base, oblong; calyx spathaceous, 1.5 cm. long, likewise hyaline, parallel veined, apex obtuse, entirely glabrous; corolla tube 3 cm. long, gradually enlarged toward the top, otherwise very slender; lateral 3 lobes 1.5 cm. long, very flaccid, purplish streaked in the middle region, margins similarly spotted, the side ones narrower and acuminately pointed, broadly lanceolate especially the middle one; lip 2 cm. long, 1.5 cm. wide, cuneate at the base; the lamina with a pair of lobules from the base, broadly oblong, the main or middle portion terminated by a subtruncate usually notched apex, all purplish spotted and streaked, the thin margins crisp; free filament very flat, purple spotted, glabrous, short; anther at least 1 cm. long, linear or a trifle wider toward the bifid base, entirely glabrous, the connective extended into a slender recurved spotted beak; style thicker toward the distal end and similarly spotted, terminated by a ciliated infundibular stigma protruding from the end of the anther beak; ovary glabrous, bearing a pair of yellow erect glabrous very linear appendages 4 mm. in length.

Type specimen number 14317, *A. D. E. Elmer*, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, October, 1915.

Dense patches in stony ground of open meadows at 500 feet altitude. The flowering heads were wholly green, turing red in the fruiting state. "Layag sa solog" in Bicol.

Possibly only a rank form of *Zingiber zerumbet* (*Linn.*) *Sm.*, but our plant is much larger, the stipules or ligules being twice the length, and the leaves two to three times as long.

Zingiber bulusanense Elm. n. sp.

Few stemmed clusters. Stems stout, 2 m. long or longer, ascending from the base, reclining toward the top, 2.25 cm. thick, dark green, enlarged at the base, the basal one third leafless. Rhizome short, crooked, few and short branched, appearing as a nodulose cluster; roots long, fibrous, yellowish as the rhizome, arising from both the stem bases and the rootstocks. Larger leaves divaricate, alternate, 3 to 6 cm. apart, reduced and scattered toward the base, more numerous and narrower toward the distal end, the slenderly acuminate point recurved, coriaceous, paler green beneath, curing unequally greenish brown on the two sides, the smaller lanceolate, the larger ones lanceolately oblong, sessile, 40 cm. long by 6 to 7 cm. wide across the base or a trifle below it, margins straight, glabrous, less tapering toward the broad base whose margins are recurved at the base; lateral nerves oblique, very numerous, faint; midvein light brown when dry, raised beneath, carinate, sparsely hairy along its sides, sunken on the upper side toward the base; sheath dirty pubescent especially toward the top, easily separated from the stem and overlapping, strongly carinate, margins reddish brown and glabrous on the inner side; ligule composed of 2 blunt projections, obtuse or irregularly truncate at the ciliate apex, 5 mm. long, shorter on the smaller blades, chiefly reddish brown. Peduncle 15 to 20 cm. long, 2 cm. thick, terete, greenish, covered with purplish fringed bracts, erect from the rhizomes, few to a cluster; inflorescent head ovoidly ellipsoid, 12 to 20 cm. long by 8 cm. thick; outer bracts water containing, becoming separated as the fruits mature, otherwise closely imbricated, obcuneate, 4 cm. long, fully as wide across the truncate top, one half as wide at the base, the apical portion thickest and rigid, made strong by the much incurved outer or exposed red portion, otherwise white; bracteole or inner bracts 3 cm. long or longer, 8 mm. wide across the base or widest portion, hyaline and purple spotted along the marginal sides toward the obtuse apex, minutely striate, the sides well imbricate, puberulent on the back toward the finely ciliate apex, gradually tapering from the base to the apex. oblong; calyx 2 cm. long, tubular, very hyaline, faintly parallel veined, purple spotted toward the truncate apex, glabrous, well separated toward the top on the ventral side; corolla tube 3 cm. long, gradually thickened toward the distal end, otherwise slenderly tubular; the 3 outer lobes 1.5 cm. long, finely veined, spotted along the margins and toward the apex, very hyaline; the lateral lobes broadly lanceolate and with acute apices, the middle lobe oblong and with an obtuse apex; lip 2 cm. long, the basal one third densely veiny and spotted, cuneate; the lamina portion triangular in outline, the base nearly as wide as the whole length, obscurely lobulate at the base, subacute at the apex, hyaline, spotted, the margins flaccid, rugulose and usually incurved; free portion of filament short, thin, flat; anther 12 mm. long, one fourth as wide, linear, bifid at both ends, glabrous, extended into a long purplish spotted beak; style filiform, glabrous, spotted and gradually thickened toward the apex; stigma infundibular, the margin with hyaline ciliate hairs; ovary glabrate, with a pair of yellowish white linear appendages 4 mm. in length. Unopened capsule 3 cm. long, fully one half as wide, truncate at the apex, bluntly pointed at the base, triangular but the ventral side broader than the two dorsal sides, white throughout, watering off at the apex and dehiscing from the apex downwards along the 2 lateral sutures and along the dorsal loculicidal one; the 3 carpels are very unequal in width, the rear broad one remains practically straight, while the 2 lateral equal ones press outward and become widely separated nearly to the base, the sides of the carpels become reflexed rather prominently, gaining sufficient strength to crowd the imbricate bracts far out in order that the seeds may properly escape; seeds in the lateral cells 7 to 10, attached to the thick white placenta in 2 close rows and alternating in an ascending fashion, the dorsal cell contains only one or at most a few seeds at the top of the cavity; seeds surrounded by a white fleshy membrane and which becomes lacerated from the apex toward the base, sessile or subsessile, seeds 6 mm. long, nearly one half as thick, ellipsoid or more obovoidly so, shining, blackish brown, purplish at the basal attachment of the hilum, terete or very obscurely angular toward the apex. When dry the seeds are disseminated by ants, when wet they are washed out.

Type specimen numbers 15178 and 16914, *A. D. E. Elmer*, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, November 1915 and August 1916 respectively.

Seen several times in the forests at 1500 feet altitude of mount Bulusan, and is easily recognized from all other Philippine species by its dirty pubescent sheaths.

LEAFLETS OF PHILIPPINE BOTANY

EDITED BY A. D. E. ELMER, A. M.

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PALMS of the PHILIPPINE ISLANDS

Collected and distributed by *A. D. E. Elmer*

by

O. Beccari

(*Florence, Italy*)

ARECA Linn.

Areca Catechu Linn. Sp. Pl. ed. I^{a}, 1189 et ed. II^{a}, 1659.

Field-note:—Erect tree, 30 feet high, with smooth grayish white bark; rings conspicuous and closely set toward the top; leaves 4 to 7 feet long, ascending and recurved toward the distal end; the stalk green and very rigid; leaflets fan-shaped, ascending, rather dense all along the whole of the midrib; sheath 3 feet long, green, smooth, swollen toward the base; fruiting cluster spreading or deflexed, 1 to 2 feet long, branched from near the base; branches not numerous, rigid, rather thick and green; fruits yellow when mature.

Luzon: Lucban (Mt. Banahao), Province of Tayabas, May 1907, number 9295. In Tagalog "Bunga". Primarily grown for the nuts which are chewed by the poorer natives with lime and leaves of certain species of *Pipers*.

Areca Whitfordii Becc. in Philip. Journ. Sci. II, 219, 1907.

Field-note:—Very slender tree; stem 3 inches thick, 20 to 30 feet high or higher, terete, ringed especially toward the top, greenish gray, the central wood tissues soft, even the rind not very hard; leaves 2 yards long or shorter, not numerous, horizontally spreading, recurved

MISSOURI BOTANICAL
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toward the ends, leaflet bearing from near the base; the smooth fusiform sheath portion green and less than a yard in length; inflorescence erect, the size of a lady's hand, light cream color, arising from below the sheath; peduncle recurved; flowers odorless, very easily falling.

Luzon: Irosin (Mt. Bulusan), Province of Sorsogon, June 1916, number 16240. Collected in damp woods of steep creek gulches at 500 feet altitude.

Areca Ipot Becc. in Leafl. Philip. Bot. II, 639, 1909. *Areca Catechu humilis Blco.* Fl. Filip. ed. II, 495, 1845.

Field-note:—Small erect tree; stems 3 to 5 inches thick, at most 12 feet high, the rings averaging 4 inches apart; sheath 2 feet long, smooth, green, swollen near the base; leaves 3 to 5 feet long, several, gracefully recurved; midrib green and rigid; leaflets ascending, recurved toward the apex, strongly ridged and grooved; stalk of fruit cluster 3 to 6 inches long, flattened, strongly recurved; fruits sessile, densely clustered, deep orange red, smooth, irregular in shape, more or less angular at the base.

Luzon: Lucban (Mt. Banahao), Province of Tayabas, May 1907, number 9292 The natives or Tagalog call it "Bunga-Ipot" while the regular "Betle-nut" they call "Bunga". The nuts are used by the natives but are not as good as those of *Areca Catechu Linn.* Chiefly planted in barrios and around farm houses for ornamental purposes. Some of the smaller trees were no higher than a man and already in fruit. The fruiting cluster is dense and appears as a solid mass. With the relatively stocky stem and dark green foliage, it presented a fine appearance in rows along paths and alleys.

Areca Caliso Becc. sp. nov.

Mediocris, caudice 5-6 m. longo; frondium segmentis numerosis, aequidistantibus, bicostulatis, subfalcato-acuminatis; spadice dense paniculato, simpliciter ramoso, ramis numerosis in parte basilari crassiuscula flores foemineos numerosus alternos ferentibus, superne angustatis et floribus masculis alterne disticis onustis; floribus masculis exandris, sepalis parvis omnino liberis, antheris acutis; fructibus ovato-ellipticis utrinqua attenuatis, mediocribus, 3-3.5 cm. longis, 20-22 mm. in medio crassis; pericarpio in fibras molles tenuissimas omnino facile solubili; semine globoso ovoideo, 18 mm. longo.

A tree about 6 m. high or at times less. Stem about 12 cm. in diameter. Leaf sheaths about 70 cm. long. Leaves 2.7 m. long (in one specimen) inclusive of the petiolar part; the latter 25 cm. long, very deeply channelled above, rounded underneath, about 2 to 2.5 cm. thick; the rachis very robust, 25 to 28 mm. long, broad in the intermediate portion, strongly flattened with flat side faces and an obtuse upper salient angle. Leaflets numerous, uniform, equidistant, the lower opposite or nearly so; the upper ones regularly alternate and 7 to 9 cm. apart, thinly papyraceous, green, paler beneath, linearly lanceolate, narrowing a little to a slightly sigmoid base to which two very prominent costae converge, the apices a trifle falcate, gradually acuminate and subulate, the intermediate leaflets are 90 to 95 cm. long and 6 to 7 cm. broad. Spadix simply branched, 30 cm. long while in anthesis, composed of several erect very appressed ascendent branches, the whole borne on a flattened pedicellar part 4 to 5 cm. long and about 18 mm. broad at its neck-like portion (that which remains above the insertion of the general spathe), very suddenly and considerably broadening below to a very narrow crescent-like amplectent expansion. The branches of the spadix are 15 to 20 cm. long, thick in their lower half or third portion and where they carry female flowers only, whereas they are slender and strongly zigzag sinuous above where at every indenture the male flowers are distically and alternately attached; this upper portion of the branchlets is perishable; the lower is very thick and permanent, and carries closely packed female flowers only, and which forms a dense ovate panicle about 15 cm. in length. The branches of the spadix, as well as the fruits, are chiefly arranged somewhat unilaterally, or turned to the outer side of the panicle; two or three of the lower branches have a flattened pedicellar part, 10 to 15 mm. long by 6 to 8 mm. broad, and are provided at their bases with a narrow and elongated subulate and membranous spathe or bract, carrying 8 to 14 female flowers and of which the lowest ones are very approximate, while the others are regularly alternate at each flexure of the branches; the upper branchlets have a shorter pedicel-like portion, with inconspicuous bracts at their bases, and carry fewer female flowers; the pulvinuli upon which the female flowers rest are horizontal, having two very small scale-like acute bracts but without the usual rudimentary companion male flowers. Female flowers sessile, subglobose or very broadly ovoid, 8 to

9 mm. through, more or less obsoletely angular by mutual pressure; the sepals are very broadly ovate and obsoletely apiculate; the petals are suborbicular, about as long as the sepals, also obsoletely apiculate; staminodes 6, very small, dentiform, united by their bases; ovary ovoid; the stigmas short, triangular, connivent. Male flowers very minutely bracteolate, 5 to 6 mm. long, sinuously lanceolate to acuminate, irregularly trigonous; the calyx is completely divided into three small, narrow and acute sepals; the petals are wavingly lanceolate, acuminate, strongly and striately veined; stamens 6, with thickish terete filaments, more or less elongated sagittate and acuminate anthers; rudimentary ovary very slender, subulate, about as long as the filaments. Fruiting panicle ovate, dense, about 15 cm. long, its branches appressed to the main axis as in the flowering state; fruiting perianth cupularly cyathiform, truncate, about 10 mm. across the mouth, having the apices of the sepals and the petals at the same level and not at all marcescent; fruit regularly elliptical or elongately ovoid, equally tapering to both ends, 3 to 3.5 cm. long, 20 to 22 mm. thick at the middle, apex obtuse, terminated by a small circular areola encircling the small remains of the stigmas; pericarp about 3 mm. thick, dissolving entirely into very fine fibers; endocarp very thin; seed globular to ovoid, flat at the base, obtuse, 18 mm. long, nearly as broad; albumen deeply ruminated; the branches of the raphe from all around a net of irregular loops.

Areca Caliso Becc. is a very peculiar and distinct species, almost intermediate between the *Euarecas* and the *Balanocarpus*, owing to its simply branched spadix, the branches of which are however appressed to the main axis, thick and covered with numerous female flowers in the lower third or half part, the whole forming when in fruit a dense ovate somewhat unilateral panicle; the upper part of the floriferous branches is perishable, slender, strongly and irregularly zigzag to sinuous, and bears distically set male flowers at every indenture. It is also distinguishable by its male flowers being 5 to 6 mm. long, having sinuous acuminate narrow petals, 6 stamens with acute anthers, and a very slender subulate rudimentary ovary; by its relatively small elliptical fruits whose pericarp becomes wholly disintegrated into extremely fine fibers; and by the cupularly truncate non-marcescent fruiting perianth.

Mindanao: Todaya (Mt. Apo), District of Davao, May 1909, number 11898. Field-note:—Tree 18 feet high or less; stem 4 inches thick; sheath 4 feet long, 6 inches thick, yellowish, smooth, leaves horizontally spreading, several, slightly curved, about 10 feet long; leaflets descendingly curved, sublucid on both sides, paler green beneath, the two prominent nerves strongly keeled on the upper very deep green surface, extending nearly to the base; the young inflorescence at least 1 foot long, the terminal three fourths is staminate, the basal one fourth pistillate, creamy yellow or whitish; infrutescence from below the sheaths, 10 inches long, the entire cluster ovoid in shape; rachis green, rigid, 1.5 inches at the base; branches 1 to 3 inches long, equally rigid and similarly flattened; fruits elongated, ovoid or ellipsoid, smooth and shining green, 1 inch long, fully 0.5 inch across the middle or just below this, apex blunt, numerous and forming dense clusters. Discovered in very moist soil on densely wooded slopes along a streamlet at 3000 feet altitude. Called "Caliso" by the Bogobos.

Mindanao: Cabadbaran (Mt. Urdaneta), Province of Agusan, August 1912, number 13814. Field-note:—A slender erect tree; stem 4 inches thick, 15 feet high, terete, wood fibers harder on the outside, white and pulpy in the center; bark grayish green, the rings 6 inches apart toward the top; sheaths 5 feet long or shorter, yellowish, slightly thicker than the stem; fronds several, 10 feet long, ascending and recurved toward the distal end; petiole proper 1.5 foot long, 1.5 inch across, dark green, deeply grooved along the upper side; segments gracefully recurved, darker green above, the midvein or midveins ridged on the upper surface; fruit cluster ascending, from below the sheath, short paniculately branched clear from the base, rigid, 6 inches long; branches also ascending, chiefly arranged along the outer or lower side; nuts ellipsoid, 1 inch long, 0.75 inch across the middle, smooth and hard, turning yellowish when mature. Collected in wet deeply humus covered soil among large stones of woods along the Dalahion creek at 3000 feet altitude. The Manobos call it "Sacolon", and they use the fruits as a substitute for "Betle-nut." Its juice is also collected and used asa beverage.

Luzon: Irosin (Mt. Bulusan), Province of Sorsogon, November 1915, number 14839. Field-note:—A slender tree; stem straight, terete, 3 inches thick, 10 to 20 feet high, upon a bunch of subaerial roots, smoothish but ringed every 2 to 3 inches toward the sheath base, greenish but gray mottled; sheath a yard long, dull green, scarcely thicker than the stem at the slightly enlarged base; leaves several, ascendingly spreading, gracefully recurved toward their distal ends, 10 feet long, leaflet bearing from near the base; fruit cluster arising from below the sheath, strictly erect, 6 to 10 inches long, the nuts broadly fusiform and deep vermillion red. In wet ground among bowlders of very humid densely wooded flat along a stream at 1250 feet altitude.

PINANGA Blm.

Pinanga Barnesii Becc. in Webbia I, 320, 1905.

Field-note for 7924:—A slender 4 inches thick tree, about 24 feet high, with smooth solid gray bark and soft wood; rings 0.5 inch wide, 1 to 3 inches apart; leaves ascending, paler green beneath, 3 to 4 feet long; leaflets smaller and more scattering toward the base; sheath dull green, purplish tinged; infrutescence pendulous, 2 feet long, rigidly 5-branched, orange red when mature, the upper or younger infrutescences yellow to green; fruits in irregular rows, dark red but turning velvety dull black; nut purplish, surrounded by a white fibrous matrix filled with a mealy substance.

Luzon: Lucban (Mt Banahao), Province of Tayabas, May 1907, numbers 7924 and 9297. Along water courses of the woods or forests at 2500 feet altitude.

Pinanga Copelandi Becc. in Webbia I, 317, 1905.

Field-note for 13875:—Erect tree; stem terete, 4 inches thick, 15 feet high, gray or grayish brown, conspicuously ringed every 5 inches; the white central mass or the woody tissues pulpy, the outer fibers brownish and hard or at least dense; sheath 7 inches thick, 4 feet long, dull green or ater colored; fronds several, 10 feet long, ascending and finally recurved; petiole 1 foot long, green, 1.5 inches across at the base, expanded and broadly imbricate, excavated along the upper side; segments ascending from plaited bases, strongly recurved, narrower and reduced toward the base, much paler green beneath, rather limp for chartaceous; veins green and ridged above, parallel, dull yellow beneath, much broader toward the incised and subpendant segments; the several fruiting clusters arising from below the sheath, 1.5 foot long, branched all along the yellowish green rachis which at the base is much flattened and 1.5 inches in width; fruits obovoidly ellipsoid, 0.5 inch long, green to yellow and finally purpureus.

Mindanao: Todaya (Mt. Apo), District of Davao, May 1909, number 10467. The Bagobo name is "Timbagnalan" and it was collected in humus covered fertile soil of dense woods at 4000 feet altitude. Cabadbaran (Mt. Urdaneta), Province of Agusan, August 1912, number 13875. In rich moist humus covered ground of secondary forests among hemp fields along the Minusuang river at 250 feet altitude. The Manobos call it "Bagtoan."

Pinanga Woodiana Becc. in Philip. Journ. Sci. IV, 604, 1909.

Field-note for 10485:—Stem straight, 2 to 3 inches thick, 10 to 20 feet high, yellowish gray, ringed; wood soft and stringy on the interior, whitish. rind hard; sheath 2 to 3 feet long, dark green, when old becoming brown pulverulent; leaves ascending, 8 feet long or shorter, not crowded, gradually recurved; leaflets equally scattering every 2 or 3 inches and similar in width, also recurved, slightly paler beneath, rigid on the upper side; petiole 0.75 inch thick, green, 1 to 2 feet long; infrutescence arising from beneath the sheath, barely 1 foot long, its paniculate branches green; fruits arranged in 3 rows along the rather straight green rachis, 0.5 inch long, bright to dark red.

Mindanao: Todaya (Mt. Apo), District of Davao, May 1909, numbers 10485 and 11334, Collected the former number along the edge of a deeply wooded canyon of the Baruring river at 4000 feet altitude; the latter number was gathered in rich deeply humus covered soil of a moist steep forested slope at 4500 feet altitude on mount Calelan. Both numbers were called "Irar" by the Bagobos.

Pinanga philippinensis Becc. in Malesia III, 180, 1887.

Field-note: — Mostly solitary trees; stems slender, smooth, greenish, 2 to 3 inches thick, 15 to 25 feet high; rings 3 to 5 inches apart, only 1 inch toward the sheath base; wood quite brittle, reddish, the central mass fibrous and pulpy; sheath twice as thick as the stem immediately below it, 2 feet long, reddish brown; leaves thin, ascending, 3 to 5 feet long, leaflet bearing within a foot from the base of the petiole; fruit panicle pendulous, 1 foot long, green, nearly as wide; fruits strictly in 2 opposite rows.

Luzon: Lucban (Mt. Banahao), Province of Tayabas, May 1907, number 9300. In dry woods at 2000 or 2500 feet altitude.

Pinanga Elmeri Becc. in Webbia I, 322, 1905.

Field-note:—Erect or ascending trees; stems few from the same root cluster, nearly 2 inches thick, 5 to 10 or more feet high, terete, ringed especially toward the top, greenish gray; sheath angularly terete, very dull green, 3 times as thick as the stem, 1.5 foot long; fronds several, horizontally disposed, finally gracefully recurved; petiole 1 foot long, 0.75 inch thick, flat on the upper side; segments descending, strongly recurved toward their ends, rigid, paler green beneath; infrutescence divaricate or descending, at most 1 foot long, arising from below the sheath, branched from near the base; stalks pale green, widely spreading and conspicuously curved; the ellipsoid fruits reddish tinged.

Luzon: Irosin (Mt. Bulusan), Province of Sorsogon, July 1916, number 16583. Gathered in wet humus covered ground of steep jungled woods at 2750 feet altitude.

Pinanga insignis Becc. in Philip. Journ. Sci. II, 233, 1907.

Field-note for 13950:—Rather large and coarse solitary trees; stem 8 inches thick, 20 to 30 feet high or higher, ringed toward the top, bark dull gray; wood fibers dense and hard on the outside, few and mixed with whitish pulp in the center; fronds several, ascending, only slightly recurved toward their tips, up to 20 feet long; sheath 5 feet long, thicker than the stem, purplish brown; petiole 1.5 foot long, very stout, 3 inches across at the base, grooved above, similarly purplish brown on the lower surface, imbricately extended into the sheath; segments very coarse, ascending, only slightly recurved toward their ends, chartaceous, paler or yellowish green beneath, the lateral portion descending upon the nether side, plicate at the base, the 2 midveins ridged above: infrutescence arising from below the sheath, pendant, nearly a yard long, the glaucous rachis terete in general outline; the recurved peduncle flat, 3 inches wide; branches alternating from all sides of the rachis, also glaucous green, flexible, 1.5 foot long; nuts arranged in 2 rows, velvety purple red, less than 0.75 inch long, ellipsoid, tapering to a niple shaped point.

Mindanao: Cabadbaran (Mt. Urdaneta), Province of

Agusan, October 1912, number 13950. In humid soil of wooded depressions on the summit area of Duros peak at about 4000 feet altitude. "Sarawag" in Manobo. The mountain tribes use the nuts as a substitute for betle-nut.

Luzon: Irosin (Mt. Bulusan), Province of Sorsogon, November to December 1915, numbers 14909, 15445 and 15497. Lucban (Mt. Banahao), Province of Tayabas, May 1907, number 8028.

Pinanga speciosa Becc. in Webbia I, 316, 1905.

Field-note for 13739:—Small but erect tree; stem 4 inches thick, terete, 20 feet high, gray at the base, green toward the ringed top; wood fibers dense on the outside, the central mass pulpy and pale white; sheath a yard long, a trifle thicker than the stem, dark green; fronds spreading, at least 10 feet long, the basal one fourth leafless, strongly recurved; leaflets similarly recurved, dark green above, much paler beneath, chartaceous, each of the lateral portions ridged along the upper side, the terminal or wide leaflets irregularly cut at the distal end; petiole smooth and green, 2 inches wide at the base, shallowly grooved along the upper side especially toward the base; infrutescence arising from below the sheath, subpendant, 1.5 foot long, dense, the main rachis green, the hanging and alternating unbranched branchlets flavus; fruits in distichous rows, dull yellow, subtended by blackish brown bracts.

Mindanao: Cabadbaran (Mt. Urdaneta), Province of Agusan, August to October 1912, numbers 13739, 13941 and 14023. Chiefly found in ravines or upon steep stony slopes of woods between Cawilanan and Duros peaks at 1250 to 4000 feet altitude. The Manobo name for the first two numbers is "Sacolon or Sacolong" while the latter number was called "Sarawag." Todaya (Mt. Apo), District of Davao, May 1909, number 10484. Collected in fertile moist soil of dense woods at 4000 feet altitude. The Bogobos call it "Sadawag."

Pinanga rigida Becc. in Leafl. Philip. Bot. II, 644, 1909.

Field note for 10147:—Slender erect trees; stem 3 inches thick, ringed beneath the leaves, otherwise nearly smooth, brown; woody tissues rather soft, the pulp silky white, fibers more numerous in the circumference; leaves nearly 9 feet long, the basal one third without segments; stalk at the base 2 inches wide, triangular, with sharp marcescent margins, imbricated but not forming a swollen sheath; panicle upon a 1 to 2 feet long axillary peduncle which at the base is surrounded by ensiform marcescent sheaths. *

Negros: Dumaguete (Cuernos Mts.), Province of Negros Oriental, May 1908, numbers 10147 and 10187. Discovered in humid moss laden woods ranging from 4000 to 6000 feet in altitude.

Pinanga negrosensis Becc. in Leafl. Philip. Bot. II, 642, 1909.

Field-note:—Stems in small clusters; trunk smooth below. 3 inches thick and 25 feet high, gray toward the ground, green towards the top, conspicuously ringed every 1 to 3 inches; the stout triangular rachis recurved, the short stalk 0.75 inch wide at the base; leaves rather dense, 1.5 to 2 yards long, pinnae bearing nearly to the base; segments ascending, rigid, dull green, with a pair of yellowish nerves along the upper side; sheath 1.5 to 2 feet long, hard, green or glaucous green, smooth, about 6 inches thick; infrutescence subpendant from the uppermost axils of the fallen sheath scars, green; nuts yellowish red, bright red and when fully ripe a nearly velvety black.

Negros: Dumaguete (Cuernos Mts.), Province of Negros Oriental, May 1908, number 10030. Discovered in damp ravines at 3000 feet altitude.

Pinanga sibuyanensis Becc. sp. nov.

Subelata, caudice circiter 9 m. longo, et 15 cm. diam.; frondium segmentis numerosis aequidistantibus, majusculis, late ensiformibus, basi vix sigmoides, caetero usqua ad apicem rectissimi, subtilliter coriaceis, glabris subtus quam superne vix pallidioribus, validissime bicostulatis, apice breviter inaequaliter bifidis; spadicibus majusculis, ramis crassiusculis compresso-angulosis, numerosis, spiraliter insertis; fructibus 3-seriatis (saltem in parte basilari ramorum) majusculis, ovato-ellipticis, utrinque subae-qualiter attenuatis, apice conico obtusiusculo, 25-28 mm. longis, 15-17 mm. latis; semine late ovato, superne rotundato; raphidos ramis undique, etiam in dorso, anostomosato-reticulatis; periantio fructifero in ore truncato et nonnihil coarctato.

A large tree with a straight trunk about 9 m. long and 15 cm. in diameter. Leaves large, about 2.5 m.

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* The lack of the leaf boot or sheath, the petiole becoming marcescent and the panicle arising from the leaf axils would suggest some other genus, probably *Heterospathe Schef.* or *Ptychoraphis Becc.*—EDITOR.

long; the petiole 30 cm. long or less and about 5.5 cm. thick, channelled above, convex and covered with grayish brown scurf on the dorsal side; leaf sheath about 1 m. long, reddish brown. Leaflets numerous, uniform, equidistant, about 5 cm. apart on either side of the rachis, slightly paler beneath than above, strongly bicostulate thinly coriaceous though rigid, very narrowly lanceolate or lanceolately ensiform, quite straight but for the very slightly curved or subsigmoid base, gradually acuminate above to a straight rather deeply bifid summit, the division unequal, rigid, acuminately subulate; the two costae very robust and prominent on the upper surface, superficially covered with a continuous line of brown narrow scales underneath. Spadix large, recurved, panicled, having a robust peduncular part about 8 cm. long and 4 cm. broad, and which is divided into numerous floriferous branches; the latter are 6 to 7 cm. thick, subtrigonous and with irregularly 3-seriate fruits in their lowest part (the upper part not seen by me but probably flattened and with distichous fruits). Fruit large, perhaps the largest in the genus, 25 to 28 mm. long. 15 to 17 mm. through, ovoidly elliptical, almost equally narrowed to either ends, broadly conical above but with blunt apex, rather suddenly narrowed to the base which penetrates with an acute caudiculum into the perianth; the dry mature fruit has the surface marked by approximate annular wrinkles, otherwise it is smooth, apparently exsuccous and contains only very fine soft capillary fibers. Seed globularly ovoid, 18 mm. long. 14 mm. thick, with a rounded apex, blunt base and a slightly oblique area for the embryo; the branches of the raphe are numerous and form a complete net work all around the seed. Fruiting perianth depressed, 8 to 9 mm. broad at the base, 4 mm. high, conspicuously contracted at the mouth.

Sibuyan: Magallanes (Mt. Giting-giting), Province of Capiz, April 1910, number 12425. Field-note:—Erect straight tree; trunk 30 feet long, nearly 6 inches thick, grayish ringed in the otherwise greenish upper portion; wood pale white, the fibers reddish tinged, more or less pulpy even the peripheral portion relatively soft, without odor or taste; bark smooth, brown and gray mixed; foliage forming a rather compact crown, ascending and then recurved, 8 feet long; petiole about 1 foot long or shorter, 2 inches across, concave on the upper side, the lower curved surface covered with a grayish brown scurfy covering; leaflets opposite or subopposite, averaging 2 inches apart, also ascendingly recurved, tough, brighter green above, much paler beneath, its parallel lines brown beneath; sheath a yard long, nearly 6 inches thick, reddish brown; the pendulously recurved infrutescence arising from the base of the sheath, paniculately branched from near the base; peduncle proper 3 inches long, flattened, 1.5 inch wide; all branches reddish tinged; fruits yellowish green, ellipsoid, 0.75 inch long, subtended by dark red scales. Discovered in very damp wooded slopes of moist rocky soil along the Pauala river at 2000 feet altitude. The Visayan name is "Tibangan".

It is evidently related to *Pinanga insignis Becc.*, but is apparently a smaller plant yet with larger fruits, and having the surface of the seed reticulated all round by the much anastomosing branches of the raphe.

Pinanga urdanetensis Becc. sp. nov.

Gracilis; frondium segmentis nonnihil numerosis, majusculis, 8-9 cm. inter se dissitis, 3-costulatis, lanceolato-ensiformibus, apice leaviter falcatis et acuminato-caudatis, glabris, subtus pallidioribus; spadicibus parvis, ramis ad 14-15, alternato-spiralibus; perianthio fructifero parvo, 2.5 mm. lato, ad faucem parum coharctato; fructibus disticis, junioribus fusiformibus, 14-15 mm. longis.

A slender tree, 2 to 5 m. high; the trunk 3 to 5 cm. in diameter. Leaf sheaths dotted with atropurpureous scales; leaves 1 to 1.6 m. long, including the 30 to 45 cm. long subterete grayish furfuraceous petiole; the rachis is also covered with a grayish scurf; leaflets rather numerous, 8 to 9 cm. apart on each side of the rachis, chartaceous, rather firm and stiff, very dark green above in the fresh state, much lighter and subglaucous beneath, lanceolately ensiform, strongly 3-costate, a trifle narrowed toward the base yet relatively large for the size of the plant, nearly straight, only a little and very gradually falcate toward the apex which is produced to a narrow linear strip; the intermediate leaflets 58 cm. long and 4 to 4.5 cm. broad across the widest portion or at about their middle. Spadix, small, 15 cm. long more or less, with a very short pedicellar part, composed of 15 much spreading or diffused simple floriferous branches; the latter are inserted on the slender main axis quite irregularly and at different points, flattened, 8 to 12 cm. long, 2 to 2.5 mm. wide. Fruiting perianth small, cupular, truncate and slightly contracted at the orifice, 22 cm. wide and a trifle shorter; young fruits ellipsoidally fusiform, 14 to 15 mm. long; some detached mature fruits (apparently belonging to the same plant) are ovoidly elliptical, equally tapering to both ends, acute at the apex, 14 to 15 mm. long and 7 to 8 mm. thick.

Mindanao: Cabadbaran (Mt. Urdaneta), Province of Agusan, October 1912, number 14137. Field-note:—Slender tree; stem 1 to 2 inches thick, terete, strict, 2 to 5 yards high, bearing a handsome crown of leaves, dark green, ringed every 4 inches toward the top but much closer near the ground; wood fibers dingy white, denser in the sapwood region; sheaths slightly larger than the stem, varying on different stems from 1 to 3 feet in length, deep green and sprinkled with atro-purpureous dots; fronds gracefully recurved, 3 to 5 feet long, including the 1 to 1.5 foot long petiole; the latter is subterete and 0.5 foot long and is usually grayish covered; leaflets twistingly recurved, very dark green above, much lighter beneath, chartaceous; infrutescence subpendant from below the sheath, 6 inches long, paniculately branched from the base, greenish; nuts or fruits ellipsoid, velvety bright red, always less than 0.5 inch in length. Discovered in compact red soil of forested slopes of Cawilanan peak at 4750 feet altitude. The Manobo name is "Salangisog".

It belongs to the group whose leaves bear numerous leaflets, small spadix with few branches, and distichous fruits. Because of this character our new species is related to *Pinanga philippinensis Becc.*, from which it is distinguished by its larger size and especially in having considerably larger leaflets. In the herbarium specimen the leaflets acquire a dull brown on the upper surface and retain the glaucous appearance on the nether side.

NORMANBYA F. Muell.

Normanbya Merrillii Becc. in Philip. Journ. Sci. IV, 606, 1909.

Field-note:—A somewhat slender yet stout tree; stem 6 inches thick, 20 feet high, erect, covered with smooth gray bark, densely ringed toward the top; the outer portion of the wood hard and coarsely black fibrous, the larger central portion dingy white and pithy, odorless, the soft portion obscurely salty; sheath smooth, glaucous green, 3 feet long, slightly thickened toward the base; leaves 6 feet long, spreading and ultimately recurved; petiole 6 inches long, triangularly flattened, 2 inches wide across the base; leaflets ascending, chartaceously leathery, nearly flat, dull green on the upper surface, paler or glaucous green beneath; the fruiting and flowering stalks divaricately spreading from beneath the boot; the infrutescence paniculately branched from near the base, the more or less angular stalks whitish, the base of the short flattened peduncle thickened and clasping the stem; buds similar in color, flowers slightly fragrant, the filaments white, the anthers creamy yellow; pistils white as the filaments; flowers coming into bloom from the apex toward the base; fruits 1 inch long, ovoidly elongated or ellipsoid, hard, glaucous green, subtended by a whitish calyx.

Palawan: Brooks Point (Addison Peak), Province of Palawan, March 1917, number 12708. Collected in sandy soil of woods fronting the beach several miles to the south of the point. The southern Palawan natives or Tagbanuas call it "Oring-oring." More or less in limestone soils, and in northern Palawan it thrives on cliffs of the same formation. This remarkable species was published from cultivated specimens of Manila only a year before it was found in its wild state. In Manila it has been grown as an ornamental plant for many years and is known as "Bunga de Chino."

ACTINORHYTIS Wendl. et Drude

Actinorhytis calapparia Wendl. et Drude in Linnae XXXIX, 184, 1875.

Field-note:—A 40 feet high tree; trunk strict, 8 inches thick, grayish white or whitish mottled, quite smooth, more plainly ringed toward the top; sheaths 3 to 5 feet long, green, very tightly imbricate and almost stem like in size; leaves forming a rather dense crown, 10 feet long or longer, horizontal, the distal portion much recurved and even drooping. leaflet bearing within a foot or two from the base; petiole and rachis flattened, covered with a hoary white bloom, the former much thickened and quite abrupt at the base; inflorescence axillary, ascending, a yard long, paniculately branching; flowers creamy white, smooth and powdery; fruits hard, yellowish and finally red, smooth, 3 inches long, ovoidly ellipsoid.

Mindanao: Todaya (Mt. Apo), District of Davao, May 1909, number 11238. Isolated trees associated with coco-nuts and betle-nuts in fertile ground of agricultural lands at 1750 feet altitude. "Tangalo" in Bagobo.

PTYCHORAPHIS Becc.

Ptychoraphis Elmeri Becc. nom. nov. *Heterospathe Elmeri Becc.* in Leafl. Philip. Bot. II, 646, 1909.

Field-note:—A very slender tree; trunk 40 feet high or higher, about 7 inches thick toward the base, ringed toward the top every 2 to 3 inches; bark smooth and hard, conspicuously grayish white; wood seasoned and very hard on the exterior, its fibers rigid and black; leaves without a prominent sheath bole but the base of the 2 feet long petiole much broadened and clasping the stem at the base, the leaflet bearing portion about 1 yard long; segments descending, duller green beneath, tough; infrutescences several from the lower leaf axils, 1 yard long at most, the peduncle 1.5 inch wide by 0.5 inch thick, hanging, abruptly divided into a numerously branched equally long panicle, its main branches again paniculately rebranched. smooth and green as are also the ultimate branchlets which are rather lax; calyx cup finally brown; fruits green, yellowish, ultimately red.

Negros: Dumaguete (Cuernos Mts.), Province of Negros Oriental, March 1908, number 9559. Discovered on steep damp ravines of jungled woods at 3000 feet altitude. The leaf buds are edible. "Belisan" in Visayan.

Ptychoraphis intermedia Becc. sp. nov.

A Slender erect tree. Stem about 12 cm. thick, terete, nearly 12 m. high, smooth and dull gray, obscurely ringed toward the leaf crown. Leaves about 3 m. long; leaflets very numerous, equidistant, very tough, green on both sides, only slightly paler beneath, largest ones of the upper portion 55 cm. long and 2.5 cm. wide, ensiform, quite straight, very long, acuminately narrowed to the apex which has a tendency to split in the middle and appearing plicately striate; the middle costa very sharp and prominent, especially on the upper surface, the margins slightly thickened; the secondary nerves rather sharp, 2 on the nether side (1 on each side of the middle costa), more conspicuous than the others and like the midvein provided with rather numerous brown chaffy scales; the tertiary nerves are quite sharp; transverse veinlets indistinct. Fruiting spadix recurved and pendant, arising from the lower leaf axils; its panicle twice spreadingly branched, about 60 cm. long, subtended by a 30 cm. long flattened 2.5 cm. wide and fuliginous scurfy peduncular portion; its primary branches are short, divided into 2 to 3 flower bearing branchlets; the latter are rigid, thickish, subterete but wrinkled in the dry condition, 5 mm. in diameter throughout, 35 to 40 cm. in length without the flowers, all uniformly covered with fruits from the base to the top. Female flowers (judging from the fruiting perianths) about 5 mm. long; the corolla twice as long as the calyx. Fruit ovoidly ellipsoid, subacute, 12 mm. long, 7 mm. thick, a trifle asymmetrical, the apex terminated by a small circular areola. Seed broadly ovate, equally rounded at both ends, 7 mm. in length, 5 mm. in diameter; the hilum distinctly impressed all along one side; the raphe branches closely anastomosing and forming a close net work about the seed; albumen deeply ruminate. Fruits dark green, turning yellowish and finally purpureous.

Mindanao: Cabadbaran (Mt. Urdaneta), Province of Agusan, August 1912, number 13663. Field-note:—An erect slender tree; stem 5 inches thick and 25 feet high, terete, smooth and dull gray, obscurely ringed toward the leaf crown; leaves crowded and imbricated at their bases, 10 feet long, gracefully recurved; petiole proper 2 feet long, rigid, dark green, flat along the upper side, rounded beneath, expanded toward the base; leaflets horizontal or descending, dull green on both sides or a trifle paler beneath, very tough, reduced toward the distal end; fruiting panicle recurved and pendant, arising from the lower leaf axils; peduncle 1 foot long, 1 inch wide, compressed, green and fuligineous scurfy covered, quite bendable; panicle proper 2 feet long and as wide, the branches arising alternatingly, only the basal or larger ones rebranched, all the stalks flexible and green, usually curved and widely spreading; young fruits dark green, then turning flavus and finally purpureous, short ellipsoid, at least 0.33 inch long, subtended by green bracts. Discovered in well drained rocky soil of a steep densely wooded depression at 3500 feet altitude between Duros and Cawilanan peaks. The Manobo name is "Marighoy."

Luzon: Irosin (Mt. Bulusan), Province of Sorsogon, November 1915, number 14937. Field-note:—A strict slender tree; stem round, 4 inches thick, 20 to 30 feet high; the pithy wood whitish, the outside much harder; bark brown or gray, smooth and ringed especially toward the top; leaves several, ascending from the much broadened and imbricately sheathing base, otherwise gracefully recurved, 5 to 8 feet long, leaflet bearing to within 1 to 2 feet from the base; segments descending, chartaceous, equally green on both sides; petiole proper yellowish green, strongly convex beneath, curvingly grooved on the upper side, smooth; paniculate infrutescence arising from the lower leaf axils, a yard in length, branched from the middle, pendant; peduncle compressed, green and rusty or scurfy brown covered, subtended by an old sheath; branches spreading, terete, green, bendable; fruits scattered from all sides, yellow, when ripe velvety deep red. Collected on a very steep wooded incline of humus covered rocky soil at 1500 feet altitude.

It is closely related to *Ptychoraphis microcarpa Becc.*, and from which it differs in its larger spadix, in having longer and thicker fruit bearing branches; in having the three nerves besides the midvein on the lower side of the leaflets provided with paleolae; but it especially differs in the shape and size of the fruits, in the seeds being rounded at both ends and marked by the close net work formed by the branches of the raphe. Both *Ptychoraphis microcarpa Becc.* and *Ptychoraphis intermedia Becc.* are more related to *Ptychoraphis angusta Becc.* of the Nicobars than to *Ptychoraphis singaporensis Becc.* of the Malay Peninsula and Singapore.

HETEROSPATHE Schef.

Heterospathe elata Schef. in Ann. Jard. Bot. Buit, **I, 141 et 162, 1876.**

Field-note:—A slender and straight tree; trunk 8 inches by 35 feet; peripheral wood hard with dull brown fibers, the inner or central mass pithy and strewn with fibers; bark smooth, rings obscure, grayish white mottled; leaves several, spreading horizontally, the terminal portion becoming much recurved and twisted, 6 to 10 feet long, leaflet bearing nearly to the base; segments similarly recurved or drooping, tough, slightly paler green beneath; petiole 1 to 2 feet long, flattened, 3 inches wide, the upper edges rather sharp, the basal 1.5 foot much expanded and provided with stipularly shredded sheaths; infrutescence arising from the lowermost leaf axils, 3 to 5 feet long, recurved, broadly and paniculately branched from below the middle; peduncle proper 2 feet long in the larger ones, conspicuous, 3 inches wide at the base, covered with a green rigid sheath-like bract; all the stalks pale or grayish white; young fruits green, then turning to a shining death white color, ultimately red, globose, between 0.33 to 0.5 inch in diameter.

Mindanao: Todaya (Mt. Apo), District of Davao, May 1909, number 11968. Collected in fertile moist soil of wooded flats a few miles interior from the coast at Digos. In Bagobo "Salaniog."

Heterospathe philippinensis (Becc.) Becc. nom. nov.

Ptychoraphis philippinensis Becc. in Ann. Jard. Bot. Buit. II, 90, 1885.

Field-note:—Strictly erect slender trees; stem round, 1.5 inch thick, 6 yards high; bark dull brown, smoothish, obscurely ringed toward the top; wood on the outside hard and black, reddish white for the greater central soft mass; fronds gracefully recurved, several, 5 feet long or longer; petiole 3 feet long, the basal one third much expanded and erect, with lacerate dry margins, forming an obscurely angular sheath whose enlarged base is 2 to 3 inches thick, yellowish green, flat on the upper side; leaflets ascending, recurved toward their tips, subchartaceous, paler green beneath; inflorescence arising from the basal leaf axils; peduncle compressed, 1 foot long or longer, yellowish green, 0.5 inch wide, erect though somewhat recurved toward the green panicle which is shorter but more recurved than the stalk; buds lighter green.

Luzon: Irosin (Mt. Bulusan), Province of Sorsogon, July 1916, number 15519. In wet more or less stony humus covered ground of densely forested flats at 2500 feet altitude.

Heterospathe negrosensis Becc. in Philip. Journ. Sci. VI, 611, 1906.

Field-note:—Slender trees; stems 2 to 3 inches thick, 9 to 15 feet high, obscurely ringed; wood soft, reddish; leaves 1 to 3 yards long, the lower one third leafless, the basal portion of the petiole expanded and its sides soon becoming marcescent; inflorescence subterminal, paniculate, 1 to 2 feet long, upon equally long peduncles; flowers small, sessile, creamy white throughout; fruits green, turning yellowish and ultimately becoming vermillion red.

Negros: Dumaguete (Cuernos Mts.), Province of Negros Oriental, March 1908, number 9439. The Visayan name is "Salaway". Its fruits are not hard and are sometimes eaten by the natives even though wholly tasteless.

Luzon: Irosin (Mt. Bulusan), Province of Sorsogon, September 1916, number 17297.

Heterospathe sibuyanensis Becc. sp. nov.

Gracilis subelata; frondium segmenta nervis secundariis conspicuis percurva; subtus secus costam mediam paleolis brunneis conspicuis praedita; spadice 3-plicato-ramoso; ramulis floriferis prorata crassiusculis (2.5 mm.

spissis); fructibus ovoideis, 1 cm. longis, 7 mm. crassis, apice conico leaviter obliquo, pericarpio sclerosomis linearibus notato.

A very slender tree 9 m. high by 12 cm. in diameter at its base, narrowing to 6 cm. at the top. Leaves about 2.5 m. long including the rather elongated petiole; leaflets numerous, equidistant, papyraceous, quite rigid, ensiform, green, a trifle paler beneath, very gradually acuminate to a slightly falcate point, also narrowing toward the base; its midvein sharp, provided beneath with some rather large chaffy scales, with 2 sharp secondary nerves on each side; the tertiary nerves also very sharp, rendering the 2 surfaces distinctly striate; margins somewhat thickened, especially the upper one; the transverse veinlets obsolete; intermediate leaflets 50 cm. long by 3 cm. broad. Spadix axillary, apparently three times branched, recurved and pendulous; the panicle large, ovate in outline, nearly 60 cm. long, borne by a flattened peduncle nearly 1 m. long; fruiting branchlets subterete, minutely wrinkled, 2.5 mm. in diameter. Fruiting perianth cupular, 3.5 mm. broad, calyx base acute; the sepals smooth, gibbous, polished; corolla twice as long as the calyx, the petals have their apices striate; floral bracteoles small and irregular. Fruit ovoid, acute but slightly oblique in its conical upper part, 1 cm. long, 7 mm. through, its surface distinctly sagrined in its dry state by linear sclerosomes. Seed globosely ovoid, with round base and broadly conical upper part, 7 mm. long, 6 mm. broad. The fruit when mature is bright red, the pulp reddish brown, the black fibers of the mesocarp coarse and hard.

Sibuyan: Magallanes (Mt. Giting-giting), Province of Capiz, April 1910, number 12350. Field-note:—A very slender tree; trunk 4 inches thick, nearly 30 feet high, 2 inches thick at the top; bark brown, smoothish or ringed toward the foliage; wood fibers of rind hard and black, the coarse pulpy mass reddish brown; leaves ascendingly spreading, gracefully recurved, 8 feet long; petiole about one half as long, 3 inches wide at the base, 1 inch thick where the leaflets begin, triangular, smooth and green, not sheathing at the base but the edges pronounced with marcescent fringes; leaflets slightly ascending, flat, a trifle paler green beneath, reduced toward the apex; inflorescence arising from the upper leaf axils; peduncle 1 yard long, flattened. strongly recurved toward the base where it is provided with a few ensiform sheaths which early become marcescent; panicle subpendulous, nearly 2 feet long, ovate in outline; fruits green, bright red when mature, ovoid, less than 0.5 inch in diameter. Discovered in red compact soil of woods along the trail to España at 750 feet altitude. "Billis" is its Visayan name.

It is the representative of *Heterospathe elata Schef.* on the island of Sibuyan. It differs from that species in the leaflets which are furnished with conspicuous paleolae on the nether side; in the fruit being ovoid and with an obliquely conical upper portion; and in the seed being slightly longer than broad, not spherical.

ONCOSPERMA Blm.

Oncosperma filamentosa Blm. in Rumphia ɪɪ, 97, t. 82 et 103, 1836.

Field-note:—Strict and slender trees; stem round, 6 inches thick, the basal 10 to 15 feet heavily beset with spines, nearly as tall as coconut trees; wood hard and brittle, black, the middle portion pithy, odorless and tasteless; bark dull brown, gray toward the top, yellowish when young, smoothish, the rings every 8 inches apart from the middle to the top or toward the sheath, conspicuously roughened and closely set; spines 3 inches long, black, flattened and thickened at their bases, descending; crown of leaves spreading, the fronds 9 feet long, horizontally scattered, finally recurved, leaflet bearing from the base; sheaths 3 feet long, 9 inches thick or two times as thick as the stem, yellowish green and provided with black spines; ligule 2 inches long, leather brown and smooth; rachis flattened below the middle, 2 inches wide at the base, green above, scurfy brown and spinescent toward the base; leaflets pendant, tough, shining dark green on the upper side, slightly paler beneath, the sides usually folded upon the lower side, the basal segments linear and hanging like shreds; inflorescence fragrant, from below the sheath, the young ones enclosed in a thick bract; panicle 2 feet long, hanging; peduncle divaricate, 6 inches in length, 3 inches wide across the base which has a pair of stout auricles; flowers light yellow except the creamy white anthers.

Palawan: Brooks Point (Addison Peak), Province of Palawan, March 1911, number 12662. These gracefully standing trees of various heights form rather large dense clusters in wet soil of swampy woods mixed with straggling mangle-wood species. The Tagbanuas call it "Anibung".

Oncosperma horrida Schef. in Nat. Tijdschr. Ned. Ind. XXXII, 42, 1871.

Field-note for 11876:—Strict and slender trees; trunk 6 inches at the base, somewhat smaller toward the top, at least 35 feet high, more or less wavy; sapwood reddish brown, hard, comparatively thin, odorless and tasteless, the balance lighter colored mass fibrous and pulpy; sheath 3 feet long, a trifle swollen, densely covered with brown spines, otherwise glaucescently green; bark smooth, grayish white, the dense rings toward the top beset with wavy deflexed flattened grayish brown or nearly black spines 1.5 inch in length; leaves spreading, recurved, 12 feet long; petiole short, usually expanded toward the base; rachis flattened, beset with darkened or nearly black spines on both sides below the middle; leaflets slightly descending, corrugated, abruptly reduced and extended nearly to the base, concave on the lower paler green side especially toward the base, tough and quite rigid; infrutescence hanging, upon 6 inches long broad and much flattened peduncles which arise from below the sheath; peduncle proper 4 inches wide at the base, spiny on both sides between the spathe scars; branches green, terete, wavy, 0.5 inch thick toward the base, averaging 2 feet long, the larger ones branched nearly to the base; fruits 0.75 inch thick, globose, hard, dark green to dark brown, shining; young flowers pale yellow, enclosed in a flattened doubly spinescent much twisted bract.

Mindanao: Todaya (Mt. Apo), District of Davao, May 1909, number 11876. Collected on a forested ridge at 2500 feet altitude in the Talon sector. The Bagobo name is "Tanaian." Cabadbaran (Mt. Urdaneta), Province of Agusan, August 1912, number 13886. In moist rocky ground of a forested ridge at 3000 feet altitude near the headwaters of the Catangan creek. The Manobos called it "Anibung."

Oncosperma gracilipes Becc. in Philip. Journ. Sci. II, 228, 1906.

Luzon: Irosin (Mt. Bulusan), Province of Sorsogon, December 1915, number 15223.

ORANIA Blm.

Orania philippinensis sibuyanensis Becc. var. nov.

A forma typica differt fructibus exacte sphaericis, magnis, 6.5 cm. diam., mesocarpio autem quam in forma typica minus crasso, 3.5-4 mm. spisso et fibris lignosis minus numerosis et tenujoribus praedito.

A tree about 5 m. high, the trunk 12 cm. in diameter. The leaves have their rachis rusty furfuraceous. The spadix of our specimen is 1.5 m. long; its spathe alone is 1.4 m. long, persistent, coriaceous, lanceolate, very gradually long acuminate, about 5 cm. broad, slightly rusty furfuraceous outside. The flowers, male and female, are as in the type.

Field-note:—Erect tree, 18 feet high, with a 4 inch thick stem; outer wood hard, yellowish, the greater inner portion soft or pulpy and of the same color; bark brown, smooth, the rings 0.5 inch apart toward the top; sheath none; leaves horizontally spreading and only a trifle curved, the terminal one half leaflet bearing; segments evenly scattered, coriaceous, dark green above, slightly curved, grayish white beneath, nearly flat; petiole about 5 to 6 feet long, the lower one half deeply grooved, the basal portion 5 inches wide, just below the segments subterete and 1 inch thick, bendable; the lower convex flower rachis surface ferruginous brown, the 2 angular upper sides less so; inflorescence creamy white, arising from the lower leaf axils, at least 3 feet long, its 1.5 foot long peduncle terete and 0.5 inch thick; the panicle somewhat drooping; its bract still persistent, nearly 5 foot long, 2 to 3 inches wide, thick, hanging, ligule coriaceous; flowers odorless; fruits ovoid, nearly 2 inches long, lemon yellow.

Sibuyan: Magallanes (Mt. Giting-giting), Province of Capiz, March 1910, number 12066. In moist alluvial soil of humid forests along the Batoo river at 750 feet altitude. "Banga" is the Visayan name.

Orania decipiens montana Becc. var. nov.

Fructibus exacte sphaericis basi non attenuatis et interdum paullo latioribus quam longis, 40-42 mm. diam.; mesocarpio 4-5 mm. spisso.

Fied-note:—Coconut sized trees; trunk 35 feet high, at least 1 foot thick at the base, 8 inches at the top, grayish white; wood fibrous and pulpy in the center, the sapwood portion brownish, with a clear sweet liquid; rings obscure except at the top; leaves 16 feet long, mostly horizontal and finally recurved; sheath base 1 foot wide, trough-like on the upper side, beneath covered with a grayish brown pulverulence, smooth except the edges which lacerate into dingy yellowish brown dry and persistent shreds, gradually narrowed and extended into the 2 feet long petiole whose edges are not lacerated; leaflets descending, gradually reduced toward the apex, quite rigid toward the base at least, the midvein strongly keeled on the upper sublucid green surface and covered with a fine tomentum, the sides roof shaped especially so toward the base, glaucous green beneath; rachis 2 inches wide at the base, fully 1 inch deep, triangular in shape toward the apex, the sides covered with a brownish tomentum; infrutescence ascending, arising from the leaf axils; peduncle subterete, 1.5 inch thick, 2 feet long, branches irregularly arising from the main or central axis which is 3 feet long, all freely rebranched and subascending; the fruit bearing branchlets green, curvingly zigzag, very slender; mature fruits flattish globose, 2 inches across, yellow as the cooked yolk of an egg.

Mindanao: Todaya (Mt. Apo), District of Davao. May 1909, number 11881. In fertile well drained soil of secondary woods mixed with grassy glens at 3000 feet altitude on the Talon or southern sector of mount Apo. "Banga" in Bagobo.

The leaflet specimen of this apparently belongs to the upper part of a leaf from an adult plant, their summit truncate on the average and rather deeply incised into several linear teeth; the fruit is 2 to 3 mm. broader than long. The fruiting perianth is 1 cm. in diameter, its calyx narrowly annular and irregularly trilobate, and the petals triangular and subequilateral.

Mindanao: Cabadbaran (Mt. Urdaneta), Province of Agusan, October 1912, number 13970. These solitary trees were found on very steep and more or less rocky densely wooded slopes along the Catangan creek at 2750 feet altitude. "Banga" in Manobo.

The leaflet specimen of this is apparently from a leaf belonging to a young plant, they are obliquely truncate at the apex and along the upper margin where they are prolonged into an acuminate point; the rachis is rusty furfuraceous beneath. The spadix has the floriferous branchlets glabrous, is long, slender and carry numerous female flowers up to above the middle. The male flowers are very narrow, linear, 7 to 9 mm. long, 2 mm. broad. Female flowers pyramidally trigonous, acute, 3 mm. broad at the base and equally as high. Fruit exactly spherical, 42 mm. in diameter.

CARYOTA Linn.

Caryota Rumphiana philippinensis Becc. var. nov. *Car-*

yota Rumphiana Mart. in Fragm. Fl. Philip. 48, 1904.

Field-note for 10940:—Tree 45 feet high and with a 7 inch thick round stem; wood hard, black, heavy on the outside, the middle portion fibrous, pithy in the center; sheath 2 to 4 feet long, not swollen but rather closely appressed and imbricated, thick, rigid, the edges giving rise to fine black hairs which neatly interlace; fronds 10 feet long, ascending at first, later descending, pinnate clear to the base; rachis 2 inches thick at the base, hard, dark green, rounded on the lower side, 2-sided on the upper; leaflets heavy, drooping, the flattened rachilla recurved, coriaceous, shining deep green above and paler beneath; infrutescence axillary, upon 3 inches thick and 1 to 2 feet long hanging peduncle; the fruiting spikes numerous, yellowish green, arranged about the terete receptacle to within a foot of the base; fruits grayish or occasionally tinged with red, impressed, 0.75 inch through, sublucid, with 3 thick bracts.

Mindanao: Todaya (Mt. Apo), District of Davao, May 1909, number 10940. Along the Baracatan creek in woods at 1500 feet altitude. Its Bagobo name is "Pola." Cabadbaran (Mt. Urdaneta), Province of Agusan, August 1912, number 13623^b. In more or less stony ground of dense woods near the Catangan creek at 1750 feet altitude. The Manobo name is "Pogahan."

Luzon: Lucban (Mt. Banahao), Province of Tayabas, May 1907, number 9301. Irosin (Mt. Bulusan), Province of Sorsogon, November 1915 and May 1916, numbers 14929, 15572 and 15931.

The general dimensions of this plant are about the same as those of typical forms from the Moluccas, but the fruit is smaller; the pinnae or leaflets have their outer margins very irregularly and obtusely or at times acutely toothed; the male flowers are 15 to 17 mm. long and have 40 to 60 stamens. Fruits 18 to 24 mm. in diameter, spherical when monosperm, broader than long when they contain two seeds; the fruiting perianth is 10 to 11 mm. across.

Caryota mitis Lour. in Fl. Cochinch. II, 569, 1790.

Field-note:—Rather slender trees; trunks usually 3 to 5 in a cluster, the adult ones 6 inches thick and nearly 20 feet high, terete, conspicuously ringed every 9 inches, dull grayish brown and smooth; wood fibrous, pithy in the center; leaves ascending and recurved, 15 feet long, the basal one third leafless, 2 inches thick at the base; sheaths dull green, the edges becoming shredded, ascending and clasping the stem, 3 to 5 feet long; middle leaflets longest, subpendant, the terminal margins usually undulate, similarly deep green on both sides, lucid on the upper surface; infrutescence few to several, along the stem below the foliage, axillary or near the side of the sheath base, numerously branched paniculately; main stalk recurved, 1.5 foot in length, densely bracteated; rachis terete, yellowish green, bendable, at least 1 foot long; fruits globosely flattened, yellowish, always less than 0.5 inch across, with somewhat viscid juice.

Palawan: Brooks Point (Addison Peak), Proyince of Palawan, February 1911, number 12606. Gathered in black moist fertile soil of woods along sluggish streams near the cost. "Bato" is the Tagbanua name.

ARENGA Labil.

Arenga saccharifera Labil. in Mem. Inst. Pr. IV. 209, 1801.

Field-note for 9296:—An erect solitary tree; trunk 40 feet high or much less, 1 to 2 feet in diameter, clothed with nearly black well interlaced fibrous matting produced from the leaf bases; fronds very long, ascending; petiole stiff, triangular, gradually tapering from the 6 inches wide base; leaflets divaricate, smooth, shining green above, glaucous white beneath, the sides strongly recurved; fruit cluster from 1 to 5 on each tree and of different ages; peduncle very strong, thick, ascending, 2 to 5 feet long, distal end pendulous and which gradually divides into many fruit bearing stalks; fruits densely clustered throughout, sessile, subtended by 3 very thick bracts, nearly 2 inches long by 1.5 inch wide, 3-umbonate toward the sunken apex, orange to lemon yellow when mature; stones or seeds 3, very hard, black.

Luzon: Lucban (Mt. Banahao), Province of Tayabas, May 1907, numbers 9296 and 7644. The young woody pulp is sometimes used as food material. The Tagalogs name it "Caong".

Arenga mindorensis Becc. in Fragm. Fl. Philip. 48, 1904.

Field-note:—Dense clumps from 5 to 8 feet across; some of these stems are 8 inches thick at the base and bear pistillate flowers, 10 feet high and gradually tapering from the ground, terminated by the inflorescence; leaves numerous, ascendingly recurved, 12 to 20 feet long; petiole one fourth the length of the frond, the larger 2.5 inches wide at the base, roundish beneath, flattened and shallowly grooved along the upper side especially toward the base, smooth, dark dull green; the rather narrow and thickly clasping imbricate sheaths copiously interlaced with long coarse ater colored fibrous hairs; leaflets strongly recurved, smooth and dark green above, glaucescently white beneath, flat; midrib carinate on the nether side, grooved on the upper, arranged in subwhorls from the upper portion of the triangular rachis, 2 to 6 in a whorl, the lowermost of each whorl suberect, the middle ones ascending, the uppermost ones horizontal, not rigidly coriaceous; female inflorescence upon a terete 2 feet long strongly recurved green peduncle, at least a yard long; branches arising from all sides, pendulous, 2 feet in length; peduncle fully 1 inch thick and with 1 foot long green bracts; corolla creamy white, calyx and ovary green as are all the stalks, flowers very sweetly fragrant.

Mindanao: Todaya (Mt. Apo), District of Davao, May 1909, number 11192. Gathered in good soil near the upper densely wooded steep slope along the Baracatan creek ravine at 1250 feet altitude. The Bagobos call it "Baris."

Arenga tremula (Blco.) Becc. in Philip. Journ. Sci. IV, 612, 1909. *Caryota tremula Blco.* Fl. Filip. 744, 1837.

Field-note:—Dense clumps; stem 6 inches thick, 10 feet high, entirely covered with old shredded leaf bases; wood soft and doty white; leaves varying from 10 to 20 feet in length, ascending from the base, otherwise strongly recurved; the rachis smooth, dark green, 2.5 inches thick at the base where it is nearly flat on the upper side, the terminal two thirds pinnae bearing; base of petiole far extended and clasping the trunk, the edges becoming shredded into brownish black coarse fibers, persistent for years and are usually bract covered; the middle pinnae 2 to 3 feet long, all descendingly curved, the sides twistingly undulate, the younger ones deep green above, whitish green on the lower surface, the immature ones rather broader, the older ones chartaceous; inflorescence 2 feet long, seldom paniculately branched, all the stalks rigid and green; flowers also rigid, soon falling after anthesis, of a peculiar fennel odor, dark red on the outside, yellowish on the interior, the numerous stamens of the same yellow color; fruits globosely ellipsoid, 2 inches long.

Palawan: Brooks Point (Addison Peak), Province of Palawan, March 1911, number 12596. Collected in damp fertile soil near swampy places of woods at 25 feet altitude near the cost. The Tagbanua name is "Batbat."

A native who accompanied me in the field carried with him a slender bamboo pole of a *Schizostachyum* species, and as I first thought as a mere cane or staff. But whenever he wanted a light for his cigarette, he would pull out a small but very fine tinder mass from under the sheaths of this palm, would carefully place and firmly hold it over a small piece of procelain or some other sort of crockery, and strike it against his silica roughened bamboo stick. Invariably he got a light even when it was raining.

Arenga ambong Becc. in Philip. Journ. Sci. II, 229, 1907. *Wallichia oblongifolia* (non *Griff.*) *Becc.* in Webbia I, 48, 1905.

Field-note:—Dense clusters 5 to 8 feet across; trunks several, ascendingly curved from the base, 6 inches thick, the bractless portion only a yard or two long, the sheath bearing portion thicker and two to three times as long; sheath fibers dirty brown or nearly black; leaves many, ascending, varying from 10 to 25 feet long; petiole 1 to 3 yards long, green, 6 inches across at the base, shallowly grooved along the upper side; leaflets horizontal or descending, grooved and twisted toward the base, margins coarsely undulate, deep green above, glaucous beneath, chartaceous; infrutescence axillary, a yard long, the short stout peduncle recurved, the numerous branches pendant; buds of staminate flowers yellowish red, the anthers deep yellow, with a strong old honey odor; nuts 1 inch long, glaucous green, hard and very tightly attached.

Luzon: Irosin (Mt. Bulusan), Province of Sorsogon, June 1916, number 16237. In well drained black soil of woods skirting the upper edge of a deep creek gulch at 500 feet altitude.

CORYPHA Linn.

Corypha elata Roxb. Fl. Ind. II, 176, 1832.

Field-note for 11965:—A giant tree; trunk dark brown, 30 feet high, abruptly constricted below the crown, 2 feet across, rugose with the coarse and transverse shredded rings; thin sapwood whitish, its peripheral portion hard and black, the greater central portion soft and pulpy, bitter to taste; infrutescences many, alternating and rather closely set; peduncle divaricate, 1.5 foot long, flattened, 3 inches wide, subtended by dry and persistent triangular bracts, covered with glaucous green sheath-like bracts; branched portion 3 feet long by 2 feet wide, numerously and paniculately rebranched, all branches whitish; fruit fully 0.5 inch in diameter, globose, hard, dull green and with fine lighter colored spots, upon slender pedicels, solitary or in pairs; leaves from a young tree, ascending, crowded; petiole 10 feet long, expanded at the base, angular in shape, triangular on the upper side, dark green, the thick keel beneath rounded, the upper edge provided with stout usually recurved teeth; blade orbicular, 8 feet across, at least one half incised, sharply plicate below the middle, the free segments shallowly curved upon the upper side.

Mindanao: Todaya (Mt. Apo), District of Davao, May 1909, number 11965. Collected in dry well drained soil of woods in the hills back of Digos at 500 feet altitude. The Bagobos call it "Serar".

Luzon: Lucban (Mt. Banahao), Province of Tayabas, May 1907, number 8294.

Sibuyan: Magallanes (Mt. Giting-giting), Province of Capiz, April 1910, number 12567.

These no doubt are forms of the "Buri" species, and as such, is a very useful plant. Its foliage is made into hats, mats and bags. At Lucban I have seen large rice bags patched not only once but two or three times over. These bags were said to be over twenty years old, and every year once or twice they were thoroughly washed and mended before they were filled with the new crop. The sap of this large tree is sometimes made into crude sugar, or after fermentation is used as a beverage by the natives. Its pulp is frequently used by the poor people as food material. The island of Burias was so named because of the abundance of these palms on it. When the species come into flower, the foliage drops off partially at least and in many cases completely, dying after fruition.

LIVISTONA R. Br.

Livistona rotundifolia microcarpa Becc. var. nov. *Livistona microcarpa Becc.* in Philip. Journ. Sci. II, 231, 1907.

Fructibus quam in varietate luzonensi minoribus, 12-15 mm. diam.; nucleo 10-13 mm. diam.; albumine ab intrusione integumenti saepius omnino, attamen non semper, transfosso.

Field-note:—A slender tree; trunk 6 inches thick, 45 feet high, evenly ringed from bottom to top, grayish white; leaves circular, strongly plicate below the middle, chartaceous, paler and subglaucescently green beneath, crowded at the top, the older ones hanging, the younger ones erect while the middle ones are horizontal. 3 to 5 feet across, the free segments also hanging; petiole 3 to 5 feet long, recurved, the basal portion much expanded, the margins densely provided with a brown matrix of shredded fibers, triangularly flattened, the edges smooth except the basal portion above the expanded base; infrutescence axillary from the basal leaves; the stalk 5 feet long, strongly recurved, covered with brown sheath-like bracts, somewhat flattened toward the base across the upper side, 1.5 inches wide; branches scattered every 6 inches, alternating, the longer basal ones 1 foot long, all yellowish; fruit 0.5 inch in diameter, globose, hard, shining vermillion red, ultimately wine red or nearly black.

Mindanao: Todaya (Mt. Apo), District of Davao, May 1909, number 11967. Gathered in rich wooded flats a few miles west of Digos. "Balla" is the Bagobo name.

Livistona rotundifolia luzonensis Becc. var. nov.

Fructibus exacte sphaericis, 2 cm. diam. albumine ab intrusione integumenti omnino perfosso.

The main character by which this variety differs from typical *Livistona rotundifolia Mart.* of the Moluccas and Celebes is found in the fruit whose albumen is traversed completely from the base to the top by the intrusion of the integument, whereas in the typical form that intrusion covers only two thirds of the albumen. Furthermore the young leaves of the variety are armed with narrow very sharp sinuous spines 15 to 20 mm. in length, whereas in the full grown plants the petioles are closely armed with short spines, the intermediate segments are briefly bifid at the apex.

Field-note:—Straight and perfectly terete trees; trunk 6 to 10 inches thick, 35 feet high; wood very hard on the outside with compact black fibers, the greater central portion pithy; bark smooth, hard, grayish white, with shallow or obscure rings; leaves comparatively short, crowded at the top, ascending; blades fan shaped, 3 to 5 feet in diameter, subcoriaceous, only slightly paler beneath; petiole 1 to 2 yards long, more or less recurved toward the distal end, green and smooth, flattened at the broadened 6 inches wide base, only 1 inch wide below the blade, edges of the basal one half usually beset with short 0.25 inch long compressed black teeth toward the expanded base, the edges of the petioles become shredded into a soft matrix of brown fibers which persist even after the leaves with their petioles have fallen, and frequently a mass of this nest material can be noticed at different heights along the stem still encircled and intact; inflorescences as many as a dozen, widely spreading among the petioles but not exceeding them; stalks arising from the leaf axils, subterete or sometimes compressed, clothed with smooth brown colored marcescent bracts nearly to their very tips, paniculately branched from near the base; branchlets smooth, light or pale yellow as are also the flowers.

Luzon: Lucban (Mt. Banahao), Province of Tayabas, May 1907, number 9293. Graceful trees scattered in subalpine forests. The Tagalogs call it ''Anahao''.

The leaves of this palm are used for thatching. The blades are doubled over and tied with rattan strips to the bamboo lattice frame of the roof. A steep and thickly laid roof lasts for many years, and when properly done the inside has a very pretty appearance of so many overlapping rows of fan chaped sections. The stem is split up into two or three inches wide strips and used as flooring. These pieces after being dressed along the inner sides and polished on the outer side are either nailed to the joice or tied down in their places with stout rattan—very much the same way as bamboo floors are constructed. Its floor surface is very smooth, hard and nearly black. The wood is also used in making diverse tool handles—such as spear handles, crude but stout axe and pick handles, knitting needles. Young plants are frequently used as pot plants.

METROXYLON Rottb.

Metroxylon Rumphii Mart. in Hist. Nat. Palm. III, 214 et 313, t. 102 et 159, 1838.

Field-note:—Large tree; trunk 40 feet high, 2 feet thick, terete and straight, covered by the old marcescent leaf sheaths, rather abruptly terminated; leaves imbricately scattered, ascending, only the lower ones divaricate and recurved, 20 feet long; sheath 3 to 5 feet long, nearly 1.5 foot wide across the base, ascending, deeply grooved on the upper side, rounded on the lower side and beset with transverse lines of needle-like spines, otherwise glaucescently green; the stipular margins soon becoming dry, 1 to 2 inches wide or wider, more or less spinescent on the outer side; petiole above the sheath 6 inches long, deeply grooved along the upper side, light green all around, smooth except the tufts of spines which are scattered along the lower side and toward the basal portion only; spines brown, flattened, at right angles, 1 to 5 or even 7 inches long; rachis smooth and green, contiguous at their bases, angularly 2-sided on the upper side, rounded below, pithy; leaflets slightly and similarly reduced at both ends, arising from the upper angular sides. divaricate, only slightly recurved, similarly green on both sides, twisted at the base, flat and rather straight, more numerous toward the apex, smooth, rigidly chartaceous; inflorescence terminal, dark brown, of 3 to 5 ascending stalks, 5 to 7 feet long; the main alternating branches ascendingly curved, 1 foot or more in length, branched all along from near the base and all more or less equal in length; secondary branches ascending, only slightly recurved, about 6 inches long, terete, 1 inch thick, brown.

Mindanao: Todaya (Mt. Apo), District of Davao. May 1909, number 11160. The Bagobo name is "Lumbia." It was collected in small semiswampy wooded flats near the Sibulan river at 2000 feet altitude.

I have seen one of these trees harvested by the Bagobos. It was a few days job for men, women and children. After the tree has been felled, its trunk was cut into three to four meter lengths, and each lenth was split into halves. Then the soft fibrous central mass was hammered out into pulp with wooden mallets. This light pulp was carried by the children to the creek where it was fed into a large square sieve-like hopper made of very stout rattan and firmly attached to a wooden frame about two meters above ground. Quantities of water was constantly thrown into the hopper and over the pulp while one to three women kept tramping over the watery mass untill all the flour has been washed out of the fibrous mass, after which the residue was thrown out. The water with the whitish flour was drained from under the hopper through a series of three differently sized boat shape vats horizontally placed and which were made of bark slabs. The first vat retained the bulk or the coarsest sago, the second the middle grade and the third the finest but the least. After all the material was washed through, the deposits in the bark vats were allowed to stand about a day or more, in order to dry and become somewhat hardened. Then the contents was taken out and sun dried, and soon thereafter it was ready for use.

During my botanical excursion into the mountains of northern Agusan province in 1912, the Manobos occasionally received shipments from the south or from the upper Agusan river region of the same food and which they called by exactly the same name or "Lumbia". The meal usually reached us in 25 pound parcels, wrapped up and sewed tight in palm sheaths,—making a round bundle, pointed at the bottom and truncate at the top. The flour is dingy white and often had a reddish tinge. There were a few grades as to purity, yet all nourishing food. I became rather fond of it, either boiled or fried and used it with cream and sugar. Cabadbaran is practically the northern most range limit of the sago palm, and since my headquarters were to the north of that town, I was unable to secure specimens of the plant. But on my way home, I first had to go on a local steamer up the Agusan river to Butuan, and along the river banks I noticed a few clumps of these trees which they say are common in the swampy lake regions at the upper waters of the Agusan river. To me they seemed quite different from my Todaya specimens—notably in having longer smooth grayish white trunks, but especially in having smooth or rather spineless sheaths and petioles.

ZALACCA Reinw.

Zalacca Clemensiana Becc. in Philip. Journ. Sci. IV, 618, 1909.

Field-note:—Large and dense tufts, stemless, about 7 to 13 in a cluster; leaves 3 to 5 in a bunch, the central ones erect, the outer ones ascending, 15 feet long or longer; petiole convex below and densely provided with needle-like 2 to 3 inches long spines, deeply grooved along the upper side, otherwise smooth, margins shredded and broadly expanded at the base, green or with glaucescent blotches; leaflets ascending from the base, strongly recurved, the slender tips pendulous, tough and rigid, dark green and sublucid above, glaucous or chalky white beneath, irregular in groups; rachis rounded beneath and with scattered spines, smooth and angular above, dirty or dingy glaucescent beneath; inflorescence arising from the side and base of the expanded petiole, erect, 2 to 3 feet high, the stalk at the base 1 inch thick, with

5 to 7 branches alternating every 3 inches; branchlets much twisted or curved, giving rise to alternating spikes, whitish, subtended by long marcescent sheaths; spikes terete, upon short whitish peduncles, ascending, usually curved, averaging 3 inches long; flowers dense, pink at least in the bud state.

Mindanao: Todaya (Mt. Apo), District of Davao, July 1909, number 11879. Collected in rich moist soil of shallow ravines in thickets near streams on the Talon or southern portion of mount Apo at about 3000 feet altitude. The Bagobo name is "Lacaubi," and it is said to bear globose edible fruits 2 inches in diameter.

KORTHALSIA Blm.

Korthalsia laciniosa Mart. in Hist. Nat. Palm. III, 211, 1838.

Field-note:—A tree climber; stem 1 inch thick or thinner, looping and widely spreading, occasionally branched at right angles, the branches also long and green, nearly twice as thick along the leaf bearing portion; sheaths green, densely beset with yellowish green or brown spines 0.75 inch long; the long interaxillary stipules also spinescent and remaining as marcescent membranes; petiole compressed, 0.5 to 0.75 inch wide at the base, smooth or spiny, 6 inches long, without the prominent basal shoulder; fronds descendingly recurved, 3 to 5 or the larger ones 8 feet long, terminated in much shorter hooked flagella; leaflets chartaceous, descending or subpendant, rugulous, subglaucous beneath; rachis green, hooked along the nether side; panicle terminal, a yard long or longer; its branches spreading, curved, clothed with smooth dark green spathes; the flower or fruit bearing portion much curved, terete, fulvous, 0.5 inch thick.

Luzon: Irosin (Mt. Bulusan), Province of Sorsogon, July 1916, number 16672. In humid forested depressions facing the Pacific ocean at 2000 feet altitude.

Korthalsia sp.

Luzon: Irosin (Mt. Bulusan), Province of Sorsogon, December 1915, number 15634.

PLECTOCOMIA Mart. et Blm.

Plectocomia Elmeri Becc. in Ann. Roy. Bot. Gard. Calc. XII, p. II, t. 22.

Grandis, caudice vaginato 10 cm. diam,; frondium segmentis per greges approximatis, utrinque glabris et virentibus; spicarum foeminearum spathis rhombeis, glabris; floribus foemineis majusculis; calycis parte pedicellari trigona elongata basi sensim attenuata, limbo 3-partito, segmentis acuminatis, longitudinem corollae fere aequantibus; fructibus globose-subdepressis, breviter mammillatis, glabris; squamis nitidis in medio distincte sulcatis et in margine ciliolatis; semine globoso-depresso, superficie inaequali.

Field-note:—Large tree climber; old stem yellowish green, when young glaucous green, terete, hard, smooth, rigid, 2 to 3 inches thick, the leaf bearing portion 4 inches thick at least; leaves alternatingly scattered every foot or so, ascending from the base, recurved toward their tips, 12 feet long, terminated by a hooked rachis at least 7 feet in length; petiole 2 feet long, glaucous green along the smooth underside, widely grooved on the upper side, provided with yellowish spines along the edges; leaflets more or less in groups, twisted and ascending from the yellowish bases, strongly recurved, similarly deep green on both sides, tough yet quite rigid; rachis grooved along the upper side, convex beneath, hooked its full length, otherwise smooth; sheaths glaucous green, also smooth except the margins of the slit portion or stipule; infrutescence terminal, quite smooth, 10 feet long, the lower branches arising from the uppermost smaller leaf stalks, 3 feet in length, the few branches ascending from near the base; branchlets pendulous or nearly so, evenly provided with bracts and fruits; nuts compressed globose, 1 inch across, finely bracteate, the short pedicel and calyx bracts persistent; pistils likewise persistent.

Mindanao: Todaya (Mt. Apo), District of Davao, June 1909, number 11877. Discovered in dense jungled woods along streamlets draining a ridge on the Talon or southern section of mount Apo at 3000 feet altitude. The Bagobo name is "Ungang," and only one plant was seen.

DAEMONOROPS Blm.

Daemonorops Margaritae palawanicus Becc. in Philip. Journ. Sci. IV, 636, 1909.

Field-note:—A rather coarse looping climber; old stem 1 inch thick, smooth and glaucous green, the leaf bearing portion 2 inches thick; leaves alternate, 1 foot apart, 10 feet long or longer, terminating into a hooked rachis twice as long; petiole proper 1.5 foot in length, yellowish green, spiny, flattened especially the upper side; leaflets recurved, submembranous, pleasing green on both sides; the shoulder of the petiole base and the glaucous green sheath densely beset with flattened spines 0.5 to 1.5 inches long and arranged in transverse rows; pistillate inflorescence leaf opposed, usually several, the upper ones in anthesis while the lower ones bear fruit, ascending or suberect, upon a short spiny stalk; bracts 10 inches long, pointed, the outer ones gray and spinescent, the inner yellowish and smooth, the pedicels and flowers similar in color and covered with an ochraceous scurfy powder, persistently included by the bracts and only bursting by the development of the fruit; pedicels of fruits green and smooth; nuts fully 0.5 inch in diameter, globose, green except the dark brown persistent stigma and lighter brown bract margins.

Palawan: Puerto Princesa (Mt. Pulgar), Province of Palawan, April 1911, number 12943. Found along woodland brooks at 250 feet altitude.

Daemonorops Gaudichaudii Mart. in Hist. Nat. Palm. III, 331, 1849.

Field-note for 11880:—Subscandent; stems 3 to 5, arising from the same root cluster, not very long, more or less densely covered with old persistent sheaths clear to the base where the woody portion is 0.5 inch thick, the leaf bearing portion 2.5 inches across; leaves ascending though finally recurved, 6 inches apart, alternate, 6 feet long, extended into a 4 feet long hooked rachis; petiole yellowish green, compressed, 1 inch wide at the base, provided with spines which are especially long beneath; rachis hooked along the nether side, spiny along the ridge above; leaflets slightly darker green on the upper surface, reduced toward the apex and somewhat more scattering, subchartaceous, descendingly curved; sheath green, densely beset with 3 to 5 inches long divaricate spines which are more or less united at their flattened bases and arranged in transverse lines; those on the margins of the sheaths more numerous and unequal in length, promiscuously scattered, much ascending, the longer ones 10 inches; infrutescence axillary, ascending from the base, otherwise pendulous, about 3 feet long, bearing 3 to 5 alternating branches 6 inches apart, its basal bract is densely provided with spines on the exterior; stalk smooth, slender, flexible, covered with a dark brown pulverulence; the branches average 6 inches in length, rather densely and finely rebranched, its pedicels with their subtending bracts brown; fruit less than 0.5 inch long, similarly tapering at both ends, very dark and dull green.

Mindanao: Todaya (Mt. Apo), District of Davao, May 1909, number 11880. In damp fertile ground among thickets along streams on the Talon or southern sector of mount Apo at 8000 feet altitude. "Nacat" in Bagobo.

Luzon: Irosin (Mt. Bulusan), Province of Sorsogon, November 1915 and July 1916, numbers 15060 and 16808 respectively. The field-notes for these specimens mentions the fruit as being sweet, luteous to aurantiacus when ripe. In other respects the size and habitat of the plant is the same as described above.

Sibuyan: Magallanes (Mt. Giting giting), Province of Capiz, May 1910, number 12494. This was noted in the field as a looping climber whose old or sheathless stem portion is one inch thick.

Daemonorops ochrolepis Becc. in Fragm. Fl. Philip. 47, 1904.

Field-note for 14120:—Lofty and looping tree climbers; stem 1 inch thick, green, ringed every foot; the leafy portion twice as thick, dark green, with a transverse ring of spines every inch or so; spines descending or the younger ones divaricate, 1 to 1.5 inch long including the yellowish green solid basal rim, the young ones purplish and ascending while in the process of turning over, the old ones dirty brown, not rigid; leaves spreading and recurved, 1 foot apart, the rachis extended into a dangling hooked whip, 6 feet long including the stalk; petiole 1 foot in length, 1 inch wide, flattened, short spiny along the edges, otherwise smooth, the basal shoulder likewise smooth; leaflets thickly chartaceous, shining and deep green on both sides, only a trifle recurved, the inside strongly recurved; infrutescence 5 feet long, smooth except for the few spines along the edge of the peduncle proper, alternatingly branched; its fruiting branches divaricate or descending, dark green; fruits flatly globose, between 0.5 and 0.75 inch in diameter, sulphureous except for the brownish tips of the scales, apex brown with numerous small scales, the base subtended by marcescent bracts.

Mindanao: Todaya (Mt. Apo), District of Davao, May 1909, number 11875. The Bagobos call it "Saladingan." Cabadbaran (Mt. Urdaneta), Province of Agusan, October 1912, number 14120. Collected in compact soil of a small depression in a humid forested ridge of Cawilanan peak at 4250 feet altitude. Its Manobo name is "Mayangan."

Luzon: Irosin (Mt. Bulusan), Province of Sorsogon, November 1915 and August 1916, numbers 14838 and 16869 respectively.

Daemonorops Curranii Becc. in Philip. Journ. Sci. II, 238, 1907.

Field-note:—Looping and climbing; stems rigid, 0.75 inch thick, dark green, jointed every 7 inches, the leafy portion 2 inches thick; fronds horizontal and recurved toward the distal ends, 8 feet long, rather crowded; sheaths yellowish green, composed of large prominent spinescent petiole bases or shoulders; the petiole proper nearly 1 foot long, 1.5 inch wide at the base, flattened, spinescent on both sides; rachis of the frond 1 yard long and provided with hooked recurved spines; leaflets descending or pendant, pale or yellowish green on both sides, dry and parchment-like, flat or curved upon the lower surface; infrutescence 1 yard long, ascending and finally recurved, pale green and mostly covered with a scurfy brown, in the young state enclosed in a foot long spinescent bract; fruit ovoidly globose or acorn-like, green except the light gray apical portion, less than 0.5 inch in diameter.

Palawan: Brooks Point (Addison Peak), Province of Palawan, March 1911, number 12663. Among thickets and trees of a sheltered place in wet ground bordering swamps near the seacoast. In Tagbanua "Saranoy."

Daemonorops pannosus Becc. sp. nov.

Mediocris, caudice vaginato 2.5-3 cm. diam; vaginis in ore nudis, caetero spinis oblique seriatis crebre armatis; frondium segmentis aequidistantibus, majoribus 30-32 cm. longis, 2.5 cm. latis, in costa media tantum utrinque spinulosis et infra, ad basin, spinula solitaria munitis; spathis primariis chartaceis, spiculis fasciculatis vel breviter seriatis praeditis; spicis foemineis erecto-patulis una cum spadicis parte axili tomento brunneo pannoso indutis, brevibus, paucifloris; mojoribus 5-6 cm. longis, flores 4-6 utrinque ferentibus; fructibus ovoideo-ellipticis, obtusis, 15-16 mm. longis, 11 mm. crassis, involucro crasso subtrigono-obpyramidato pedicelliformi suffultis; perianthio fructífero breviter obconico, dilacerato.

Scandent and of moderate size. Sheathed stem 2.5 to 3 cm. in diameter. Leaf sheaths armed with approximate oblique or transversely interrupted series of slender brown spines which are coalescent by their bases; the margin of the mouth thin and unarmed. Leaves about 1 m. long in the segmented portion; petiole 30 cm. long, flattened, variously prickly especially along the edges; rachis conspicuously spinescent throughout on the upper surface and armed beneath with 3 to 5 nate claws. Leaflets numerous, equidistant, narrowiy lanceolate, acuminate to subulate or even spinulous at the tips, concolorous, rigidulous; their upper surface is smooth except for the few spinules on the midvein near the apex; the lower side of the midvein bears even fewer spinules and is furnished with a special and relatively strong spinule exactly at the base; the other veins are smooth; the 2 nerves on each side of the midvein appear dotted by transmitted light; transverse veinlets rather sharp, short and interrupted; margins closely and sharply spinulous; the intermediate leaflets are 30 to 32 cm. long and 2.5 cm. broad. Female spadix strict. at first erect, later when loaded with fruits apparently nodding, 45 cm. long and composed of 5 or 6 superposed appressed partial inflorescences; their axial parts are clothed with a soft but dense partly deciduous rusty brown felt; primary spathes thickly chartaceous, lanceolate to acuminate, cinnamon brown inside; the outermost spathe covered all over with fascicled or briefly seriate slender spiculae; the inner spathes have only the apices spiculiferous; partial inflorescences erect, appressed to the main axis; the lower ones are 12 to 14 cm, long and have on each side 5 or 6 gradually shortened spikelets inserted at rather an acute angle; spikelets of the lower part of every partial inflorescence 5 to 6 mm. long and with 4 to 6 flowers on each side; the upper spikelets speedily become shorter and with fewer flowers, all with a rather thick main axis. The fruiting perianth is short obconic, the calyx and corolla decayed and reduced to fibrous elements only. The fruits are borne on very thick triangular to pyramidal 5 to 6 mm. long pedicels, and which are inserted at a very scute angle and formed by the union of a very well developed involucrophorum, with a short involucre; areola of the neuter flower obscurely niche-like. The apparently immature fruit having almost attained its definte size is 15 to 16 mm. long, 11 mm. wide, ovoidly elliptic, almost similarly narrowed toward both ends, shortly and broadly conical above and terminated by a mucronate point; scales in 15 vertical series; in each series at least 5 of them are well conformed, rather strongly convex, very shining, of a light straw color and with a broad brownish red band in their anticous parts; are broadly grooved especially posticously along the center, their margins narrowly scarious, very inconspicuously erose and fringed with hairs; apices obtuse.

Mindanao: Todaya (Mt. Apo), District of Davao, May 1909, number 11600.

Field-note:—A tree and jungle climber; stem 0.5 inch thick, greenish or yellowish tinged, hard, smooth, the leafy portion 2 inches thick; leaves alternatingly scattered, ascending and then recurved, 6 feet long, the rachis extended into a 3 feet long hooked appendage; petiole 1 foot long, flattened, 0.75 inch wide at the base; leaflets horizontal and tips recurved, submembranous, slightly paler green beneath; rachis spinescent along the upper side, smoothish and with scattered recurved hooks beneath; infrutescence ascending from the base, otherwise recurved, smooth except the basal spathe, the branchlets covered with a brown felt; spathes somewhat compressed toward the base, grayish brown, the spines arranged in oblique rows; infrutescence 2 to 3 feet long or longer, its branchlets ascending from the base but tips strongly recurved; fruits 0.5 inch long, ellipsoid, tapering especially toward the apex. Discovered in very humid ravines along the Mainit creek at 4000 feet altitude. The Bagobo name is "Sabilog."

It is a well characterized species, belonging in the group with *Daemonorops lamprolepis Becc.* and which it somewhat resembles. It is distinguished by its leaf sheaths being armed with seriate brown slender spines but having their mouths smooth; by the leaflets having the midvein only spinulous on both surfaces and furnished at the base on the nether side with a rather conspicuous spinule; by the female spadix being strict, having the primary spathes chartaceous and covered with short seriate but slender spiculae; by the short and thick few flowered spikelets; by the ellipsoid fruit which is conically blunt at the apex, borne on thick pedicels formed by the subtrigonous to obpyramidal involucrophorum; and finally by the soft and thick brown felt that covers all the axial parts of the spadix but especially the spikelets.

Daemonorops oligolepis Becc. sp. nov.

Majusculus, caudice vaginato 4 cm. diam.; vaginis in oro nudis, caetero spinis transverse seriatis crebre armatis; frondium segmentis aequidistantibus, majoribus 35-40 cm. longis, 2.5 cm. latis subtus in costa media prope basin spinuliferis et prope apicem setosis; superne tantum prope apicem spinuliferis; spadicis parte axili et spicis tomento ferrugineo indutis; frunctibus globosis, breviter obtuseque mucronatis, 17-18 mm. diam., pedicello gracili usque ad 10 mm. longo (ab involucrophoro et involucro composito) suffultis; squamis porpaucis per orthostichus 12 dispositis, intermediis (2-3) tantum amplis, summis et basilaribus parvis; semino depressiuscule globoso.

Scandant and rather large. Sheathed stem about 4 cm. in diameter. Leaf sheaths armed with several approximate interrupted transverse series of slender spines more or less coalescent by their enlarged bases, mouths thin and armed. Leaves averaging 2 m. long for the leaflet bearing portion; petiole 25 cm. long, more or less flattened, variously prickly especially along the edges; rachis conspicuously spinescent throughout on the upper surface, at times even on the cirrus, and armed beneath with 3 to 5-nate robust claws; the cirrus also very powerfully armed with half whorls of similar claws. Leaflets numerous, equidistant, narrowly lanceolate, acuminate to subulate (not produced) spinulous tips, concolorous, rigidulous, with the upper surface smooth, except occasionally a few spinules on the midvein near the apex; beneath the midvein it is remotely spinulous near the base and is provided with some bristles higher up; the other nerves are smooth; transverse veinlets rather sharp, short and interrupted; margins appressed spinulous; the intermediate leaflets are 35 to 40 cm. long and 2.5 cm. broad. Female spadix strict, at first erect, apparently nodding when in fruit, 70 cm. in length, composed of 7 superposed appressed approximate partial inflorescences; all its axial parts but especially the spikelets clothed with a rather thick coating of soft rusty scales. Partial inflorescences erect, appressed to the main axis; the lower ones are about 15 cm. long, on each side 4 or 5 gradually reduced spikelets, inserted at a quite acute angle; the spikelets have a rigid, thickish and sinuous main axis, the largest of them in the basal portion of the partial inflorescence are 6 to 8 cm. long and carry 5 or 6 flowers only on each side; the upper spikelets become abruptly shorter and contain fewer flowers. The fruiting perianth is short conical and in a decaying condition, the calyx and corolla being reduced to their fibrous elements only. The fruits are borne on conspicuous subtrigonous pedicels up to 10 mm. in length, inserted at a very acute angle, formed by an elongated involucrophorum supporting a well evoluted involucre, broad above and narrowing to a slender base; areola of the neuter flower obscurely niche-like. Fruit globose, briefly and very suddenly obtusely beaked or mammillate; when thoroughly mature 17 to 18 mm. in diameter; scales in 12 vertical series but usually only 4 of them well conformed in each series, and of these only the 2 or 3 central ones largest and exactly rhomboidal and 7 mm. broad, the others being considerably smaller; otherwise the scales are very shiny, quite narrowly and neatly grooved along the center, of a light straw color and very narrowly bordered with an intramarginal darker line, and with the extreme margins very narrowly scarious and minutely erose toothed, their apices are obtuse. Seed globose, very slightly depressed, 13 to 14 mm. in diameter; its surface is a trifle uneven, the chalazal fovea is apical, very small, punctiform and narrow inside; the embryo is placed in a belly-like depression exactly at the base; the albumen is deeply and very closely ruminate.

Mindanao: Todaya (Mt. Apo), District of Davao, May 1909, number 11757. Discovered in dense jungled woods of a steep ridge near the junction of the Colon creek with the Baruring river at 3750 feet altitude. Its Bagobo vernacular name is "Rogman."

Field-note:—Scandent and looping; old stem 0.5 inch thick, green, the greater portion covered with the dry, brittle and persistent sheaths; leaves scattered every 8 inches toward the top, alternate, horizontally recurved, 6 feet long or shorter, terminated into a yard long clawed rachis; petiole proper 1 foot long, usually ascending, flattish, 1 inch wide at the base, densely spinescent along the upper side, less so toward the distal end; leaflets papyraceous, descending, rather strict, similarly dull green on both surfaces, the sides folded or descending; sheaths densely covered with 1.25 inch long needle-like brown spines, dull green otherwise; infrutescence opposite the leaves and a trifle below them, but occasionally in their axils, recurved and subpendulous, 3 feet long; spathe at the base spinescent, otherwise glabrous or spineless; the more or less angular ultimate stalks covered with a brown integument; fruit globose, at least 0.5 inch in diameter, glassy pale green or turning to a deathly white when fully mature, the minute apical scales grayish, the others with brownish tips, the ripe fruit very insipid.

It is very closely related to *Daemonorops pannosus Becc.* which it much resembles in its vegetative organs, but it is a larger plant than that and whose leaflets on the lower side are devoid of the solitary spinule at their bases; instead of that solitary spinule which is a special character of *Daemonorops pannosus Becc.*, there are in *Daemonorops oligolepis Becc.* several smaller spinules. It also differs in having its fruits borne on longer and narrower pedicels; the fruits themselves are spherical and with only 2 or 3 large and well conformed scales in each arthostichy, all the other scales being much reduced in size.

Daemonorops urdanetanus Becc. sp. nov.

Mediocris, caudice vaginato 2.5 cm. diam.; vaginis in ore nudis, caetero spinis gracilibus, transverse seriatis, crebre armatis; frondium segmentis, aequidistantibus, majoribus 30 cm. longis, 15-16 mm. latis, supra secus nervos 3 et subtus tantum secus costam mediam setosis; spicis foemineis rubiginose tomentosis, erecto-patulis, majoribus 5-6 cm. longis, paucifloris; fructibus globoso-ovoideis breviter abrupteque rostratis, rostro crasso et obtuso, 18 mm. longis 15-16 mm. crassis, pedicello gracili usque ad 10 mm. longo suffultis; squamis per orthostichas 15 dispositis; semine globoso minime depresso.

Scandent and of moderate size. The sheathed stem 2.5 cm. in diameter. Leaf sheath armed with approximate oblique or transverse interrupted series of slender brown spines, coalescent by their bases; the margin of the orifice thin and unarmed. Leaves about 1.5 m. long in the segmented portion; the petiole 25 cm. long, somewhat flattened, variously prickly; rachis conspicuously spinescent throughout on the upper side and armed beneath with 3 to 5-nate robust claws. Leaflets numerous, equidistant, linearly lanceolate, acuminate to subulate apices and produced into filamentous bristly tips, concolorous, rigidulous, conspicuously bristly on the upper surface along the midvein and along 1 nerve on each side of it; only the midrib beneath is bristly; transverse veinlets short and interrupted; the margins appressed and very minutely spinulous; the intermediate leaflets are 30 cm. long and 15 to 16 mm. broad. Female spadix strict, at first erect, apparently nodding when in fruit, 65 cm. long and composed of 6 superposed appressed approximate partial inflorescences; with all its axial parts but especially the spikelets clothed with a coating of adherent rusty scurf. Partial inflorescences erect, appressed to the main axis, the lower ones about 10 cm. long, carrying on each side 5 or 6 gradually shortened spikelets which are inserted at a rather acute angle; spikelets with a thick rigid trigonous main axis, the largest of them in the lower parts of the partial inflorescences are 5 to 6 cm. long and contain 4 or 5 flowers only on each side; the upper spikelets reduced and have fewer flowers. The fruiting perianth is almost explanate yet in a decayed condition, having the calyx and corolla reduced to their fibrous elements only. The fruits are borne on conspicuous subtrigonous spadices, 8 to 10 mm. long, wide at the apex from which it gradually narrows to the base and inserted at a very acute angle formed by an elongated involucrophorum supporting an also well evoluted involucre; areola of the neuter flowers obscurely niche-like. Fruit globose to ovoid, shortly and very suddenly beaked, the beak stout and obtuse, 15 to 16 mm. in diameter by 18 mm. long including the beak; scales in 15 vertical series, usually 5 or 6 in each series are well conformed, the 2 or central ones are 4 to 5 mm. broad, the others are smaller; they are all very shiny, very narrowly and neatly grooved along the center, of a light straw color and very narrowly bordered or at times quite obsolete or with an intromarginal dark line, the extreme margins are very narrowly scarious and minutely erose toothed; the apices are slightly produced, appressed and blunt. Seed globose, not depressed, 13 mm. in diameter, its surface slightly uneven; the chalazal fovea is apical, pit-like, penetrating rather deeply; the embryo is placed in a belly-like depression exactly at the base; the albumen is deeply ruminate.

Mindanao: Cabadbaran (Mt. Urdaneta), Province of Agusan, October 1912, number 14201. Discovered in dense forests of a gentle rocky slope at 5500 feet altitude or about 500 feet above a small alpine lake. The Manobo name is "Sahaan."

Field-note:—Middle sized tree climber; stem looping, 0.5 inch thick or only 0 33 toward the base, fully 1 inch thick along the leaf bearing portion; nodes every 8 inches apart, dark brown and quite smooth; sheaths dull green, densely provided with brown bristles averaging 1 inch in length; leaves alternating every 8 inches, more or less recurved, about 2 yards long without the subpendant clawed rachis; petiole 10 inches long, 0.75 inch wide, flattened and stoutly spiny even the thickened shoulder; leaflets pendantly recurved, flat, chartaceous, equally green on both sides; infrutescence arising nearly opposite the leaves, 2 feet long, smooth, recurved, rather linearly disposed, alternatingly rebranched; the fruit bearing branchlets paniculately rebranched, angular; fruit 0.5 to 0.75 inch in diameter, globose, shining glaucous green or yellowish, the margins of the scales pale brown; its apex long and blunt.

Daemonorops pannosus Becc., *Daemonorops oligolepis Becc.* and *Daemonorops urdanetanus Becc.* are closely related species, all to be included in the group with *Daemonorops lamprolepis Becc.* Our present new species is more like *Daemonorops oligolepis Becc.* than to *Daemonorops pannosus Becc.*, differing from the former in its smaller dimensions; in the leaflets having 3 bristly nerves above and terminating into a filamentous apex; and especially it differs from *Daemonorops oligolepis Becc.* in having globosely ovoid fruits with more numerous scales and in the globose not at all depressed seeds.

Daemonorops pedicellaris Becc. sp. nov. *Daemonorops Curranii Becc.* in As. Palm. Ann. Roy. Gard. Calc. XII, I. 142 (as to the plant from Mindanao only, and to the 3 figures on the left hand side of plate 58).

Mediocris, caudice viginato 18-25 mm. diam.; vaginis in ore nudis, caeterum spinis inaequalibus acicularibus dense obsitis; frondium segmentis in pagina superiori secus nervos 5, et subtus incosta media tantum setosis, majoribus 30 cm. longis, 15-20 mm. latis; spathis spines gracilibus acicularibus praeditis; spicis floriferis 4 5 cm. longis, patentibus, paucifloris, fructibus ovoideo-ellipticis, breviter obtuseque rostratis, 12-17 mm. longis, 9-11 mm. crassis, ab involucrophoro conspicue pedicelliforme et 4-6 mm. longo suffultis.

Scandent and of moderate size or rather slender. Sheathed stem 18 to 25 mm. in diameter, naked canes 10 to 15 mm. thick. Leaf sheaths very densely armed with closely and irregularly seriate unequal narrowly linear dark brown or nearly black spines 10 to 15 mm. in length; often the spines are so slender as to resemble bristles. Sheath orifice thin, dry, brittle and unarmed. Leaves about 1 m. long in the pinniferous part; petiole 10 to 20 cm. long, flattened, variously prickly especially along the edges; rachis spinulous on the upper side, armed beneath with seriate or half whorled claws; the cirrus similarly clawed at approximate and regular intervals. Leaflets numerous, equidistant, linearly lanceolate, subulately acuminate to a filiform bristly tip, thinly chartaceous, concolorous and sublucid on both surfaces, usually bristly along the 5 nerves on the upper side and on the midvein beneath; the margins closely and spreadingly spinulous; transverse veinlets short, not numerous nor very apparent; the intermediate leaflets about 30 cm. long, 10 to 20 mm. broad, the upper leaflets gradually reduced. Spadix rather slender, at first erect, later nodding, 50 to 60 cm. long, the pedicellate portion more or less provided with slender or else bristle-like spines, the panicle is composed of 5 to 7 superposed and gradually diminishing partial inflorescences; the main axis, branches and spikelets glabrous and slightly rusty furfuraceous. Primary spathes papyraceous, exsuccous, narrow, elongately acuminate, covered irregularly throughout with bristle-like spinules. Partial fruit bearing inflorescence spreading and having a very conspicuous callus at their axilla, the lower ones are 8 to 10 cm. long and carry on each side 4 or 5 gradually smaller spreading divaricate spikelets; the lower spikelets in every partial inflorescence are 4 to 5 cm. long and contain 5 to 7 flowers on each side, occasionally the spikelets are longer and with 8 to 10 flowers on each side; the upper spikelets soon become shorter and consequently with fewer flowers. The female flowers are relatively large as is shown by the fruiting perianth which forms a very narrow base and is broadly campanulate, with spreading or recurved conspicuous triangular persistent petals. The involucrophorum is distinctly pedicelliform and together with the involucre raised, it forms a pedicel to the fruit at times as much as 5 to 8 mm. long yet frequently less, the pedicels at the fruiting stage are kept spreading by a conspicuous callosity at their axilla; areola of the neuter flower obscurely nichelike. Fruit globosely ovoid or ovoidly elliptic, equally rounded at both ends, suddenly and obtusely beaked, 12 to 17 mm. long including the beak and perianth, 9 to 11 mm. broad; scales in 15 vertical series, shiny, of a dirty straw color, more or less distinctly bordered all around with a narrow purplish or purplish black band, rather deeply groved along the center especially in their posticous parts; the apices slightly produced, blunt; the extreme margins very narrowly scarious and minutely erose toothed. Seed oblong, 8 to 10 mm. in length, rounded at both ends, boldly tubercled; chalazal fovea quite superficial and indistinct; albumen ruminate, embryo basal.

Field-note for 14132:—Scandent and of middle size; old stem looping, less than 0.5 inch thick, the joints 6 inches apart and rather smooth; the leafy portion at least twice as thick and densely spiny; leaves scattering alternatingly every 6 inches or nearly so; petiole 6 inches long, flat, spiny along the sides or edges and along the lower side only; the upper and lower half of the shoulder base smooth, otherwise spiny; sheaths dark green, densely covered with subfumosus colored flattened ascending 0.75 inch long numerous spines which are obliquely arranged in circles; frond 4 feet in length, the rachis extended into a strongly clawed appendage; leaflets much recurved or nearly drooping, thinly chartaceous, similarly dark green on both sides; infrutescence arising from above the leaf axils, in the fruiting state recurved; the peduncle proper compressed. spiny, also dark green; branches few, alternating, recurved. smooth, lax; mature fruits or nuts cremeous except the brown margined scales, 0.5 inch long, truncately ellipsoid especially at the apex which is terminated by a short rather stout point.

Mindanao: Todaya (Mt. Apo), District of Davao. May 1909, number 11896. In forests south of mount Apo at 3500 feet altitude. This the Bagobos also called "Rogman." Cababaran (Mt. Urdaneta), Province of Agusan, August and October 1912, numbers 14132 and 13853. The Manobos call the first number "Obanoban" and the other "Hiyod." Collected both numbers on a steep forested incline or ridge of Cawilanan peak at 4750 feet altitude.

The specimens on which this species is established were formerly referred by me to *Daemonorops Curranii Becc.* which however belongs to the group of species having like *Daemonorops Hystrix Mart.* the mouth of the leaf sheath armed with long spines; whereas *Daemonorops pedicellaris Becc.* is related to species which, like *Daemonorops lamprolepis Becc.* have that portion unarmed and the spathes covered with slender acicular spines. Our present new species is particularly distinguishable by the great development of the involucrophorum, causing the fruit to appear very distinctly pedicellate. The length of this pedicel however varies, in *Mr. Elmer's* numbers it attains 5 to 6 mm. in length, while in *Mrs. Clemen's* Mindanao specimen number 1280 the pedicel is barely one half as long. In my monograph of the genus *Daemonorops*, I supposed 1280 *Clemens* from Lake Lanao to belong to *Daemonorops Curranii Becc.*, but now I consider it only a robust form of *Daemonorops pedicellaris Becc.* Good diagnostic characters are also found in the leaflets having 5 ibristly nerves above and the midrib beneath; the spreading spikelets having few rather distant flowers on each side; the ovoid elliptical shortly beaked fruits; and the tubercled seed without the distinct chalazal fovea. The size of the fruit also varies, 11896 *Elmer* from Todaya has somewhat smaller fruits than his other two numbers and which I consider as the true type specimens.

Daemonorops affinis Becc. sp. nov.

Mediocris, caudice vaginato 3 cm. diam.; vaginis spinis laminaribus seriatis patentibus, in ore erectis et valde elongatis, armatis; frondium segmentis aequidistantibus, anguste ensiformibus longe et sensim acuminatis, mejoribus 55-60 cm. longis, 20-22 mm. latis, superne glabris vel prope apicem in costa media spinulosis, subtus in costa media solummodo sparse setosis; spadicis ramis et spicis angulo valde acuto insertis; fructibus globosis, 12 mm. diam., abrupte breviterque conice rostratis, una cum rostro et perianthio 15 mm. longis, involucro pedicelliformi subobconico, 3·5 mm. longo, sulfultis; semine sphaerico, chalazae fovea profunda inconspicua punctiformi.

A moderate sized tree climber. Sheathed stem 3 cm. in diameter, naked canes 15 to 20 mm. thick. Leaf sheaths armed with closely seriate spreading slender elongate laminar black spines, the spines at the mouth of the leaf sheath much longer and broader than the others and erect. Leaves large, 1.8 m. in the pinniferous part; petiole 50 to 60 cm. long, slightly flattened, armed all around with unequal spreading prickles, rachis prickly on the upper salient angle and armed underneath at regular distances with half whorls of hooks, the cirrus robust and similarly armed as the rachis. Leaflets very numerous, broader in the lower third, thence very gradually long acuminate, one half of the nerves smooth on the upper surface except for the few spinules near the apices, on the nether side only the midvein has a few short bristles, margins appressed spinulous; transverse veinlets sharp; the intermediate leaflets are 55 to 60 cm. long and 20 to 22 mm. broad. Fruiting spadix thinly rusty furfuraceous in every part, recurved; its pedicellar portion is spiny; panicle strict, averaging 60 cm. in length, with several approximate gradually reduced partial inflorescences, the lower of which is 13 to 15 cm. long and bears distically 6 to 8 spikelets on each side; the latter are inserted at a very acute angle, not spreading; the lowest and largest of them are 6 to 8 cm. long and carry distícally 6 to 8 fruits on each side; involucrophorum pedicelliform, slightly obconical, 5 to 6 mm. long. Fruit quite mature, globose and suddenly conically beaked, 12 mm. in diameter, 15 mm. long including the beak and perianth; scales in 15 vertical series, exactly rhomboidal, greenish, polished, very neatly and narrowly grooved along the center, strongly appressed, the margins quite narrowly scarious, faintly bordered by a reddish brown, the tip obtuse. Seed globular, 9 mm. in diameter, minutely tubercled, a trifle less convex on the raphal side, chalazal fovea punctiform, barely distinguishable from the outside, but penetrating as a very narrow channel almost to the center of the seed. Albumen very deeply ruminate.

Mindanao: Cabadbaran (Mt. Urdaneta), Province of Agusan, October 1912, number 13978. Discovered in jungled forests on the summit of Duros peak at 4000 feet altitude. Vernacular name in Manobo is "Bag-bag."

Field-note:—A looping climber; old stem 0.5 to 0.75 inch thick, round and smooth, dull green but the greater length is covered by the old dry sheaths, leaf bearing portion 1.5 inch thick without the spines; fronds alternatingly scattered every 6 inches, mostly divaricate and gracefully recurved, 10 feet long including the 2 feet long spiny and subcompressed petiole which is 0.75 inch wide at the base and yellowish green; sheaths densely beset with 1.5 inch long dark brown and flattened spines which are divaricate and transversely arranged; those along the sheath ligule twice as long and ascending; leaflets recurved, pale green on both sides, flat, the clawed rachis one half as long as the frond; infrutescence pendant, arising some distance above the leaf axils, a yard long, the 6 inches long petiole spiny the rachis and alternating fruit bearing branches green; and entirely smooth; nuts ovoidly globose or globose, with a pointed apex, dark green but ochraceous when ripe, less than 0.5 inch in diameter, the meat somewhat sweet.

It differs from *Daemonorops Gaudichaudii Mart.* and which it greatly resembles by the elongated very gradually long acuminate leaflets; almost smooth on the upper surface except for the occasional spinule along the midvein near the apex and having only a few bristles on the midrib beneath; by the partial inflorescences and especially by the spikelets not spreading, but inserted at a very acute angle; by the smaller fruit being short and less convex, not tubercled on the raphal side, and in having very narrow although very deep chalazal fovea almost inconspicuous from the outside.

Daemonorops gracilis Becc. sp. nov.

Gracillimus, caudice vaginato 12-15 mm. diam.; vaginis spinis patentibus, laminaribus, sparsis vel plus minusque confluentis, in ore valde longioribus et erectis, armatis; frondium segmentis aequidistantibus, majoribus 25-28 cm. longis, 13 mm. latis, superne secus nervos 3 parce spinulosis, subtus prope apicem tantum secus costam mediam setis brevibus praeditis; spadice gracili, fructibus late ovoideo ellipticis, utrinque rotundatis, apice minute acuteque mucronatis, 12 mm. longis, 9 mm. crassis, involucrophoro pedicelliformi 2-3 mm. longo suffultus; squamis per orthostichas 15 ordinatis, in medio nitide sulcatis; semine globoso-oblongo, 8 mm. longo, 6 mm. crasso.

Slender and low scandent or sprawling rattan. Sheathed stem 12 to 15 mm. in diameter, the naked canes 4 to 8 mm. in diameter. Leaf sheaths densely covered with blackish flattened spreading or deflexed unequal spines, scattered or at times more or less confluent by their bases and 1 to 2 cm. long, the orifice armed with spines similar to the others but considerably broader and longer, that of the longest 5 cm. in length. Leaves about 1 m. long without the stalk; petioles 15 to 25 cm. long, somewhat flattened and variously prickly, usually armed with a few long straight needle-like spines along the margins toward the base, the rachis more or less prickly on the upper surface of its basal part; underneath not strongly clawed; the cirrus slender and armed at regular intervals with 3 to 5-nate feeble but very sharp claws. Leaflets numerous, equidistant, linearly lanceolate, very gradually acuminate to a very finely subulate tip, thinly chartaceous, equally green on both sides; on the upper surface the midvein is almost smooth, the lateral 2 nerves on each side of it are obscurely spinulous, beneath the midvein alone bears short bristles from the middle to the apex, the margins are very minutely and appressedly spinulous, the intermediate leaflets are 25 to 28 cm. long and 12 to 14 mm. broad. Female spadix slender, erect, apparently axillary, 25 to 50 cm. long and bearing 3 or 4 partial inflorescences; the outermost spathe coriaceous, linearly oblong, bidentate at the apex, armed on the dorsal side with slender at times digitate spines along the central line. Female flowers slender, 5 mm. long, 2 mm. through. Partial inflorescences spreading, 6 to 7 cm. long, carrying 3 or 4 spikelets on each side, kept spreading by a conspicuous axillary callus, the largest spikelets are 2.5 to 3.5 cm. long and carry only 4 or 5 flowers on each side. The fruiting perianth is very broadly obconical and half rotten. Fruits broadly ovoid to ellipsoid, equally rounded at both ends, surmounted suddenly by a very small acute beak, 12 mm. long, 9 mm. thick, borne on pedicels formed by their respective subtrigonous involucrophora, the latter 2 to 3 mm. in length, kept spreading by axillary callosities and surmounted by their short involucra; scales in 15 vertical series, regularly rhomboid, broader than long, rather dull, neatly and relatively deeply grooved along the center and uniform light or dirty straw color, very regularly bordered by a linear slightly darker line, the extreme margins scarious and finely erose toothed, the tips obtuse. Seed regularly and globosely oblong, equally rounded at both ends, 8 mm. long, 6 mm. in diameter, very slightly compressed, finely pitted; the chalazal fovea small, placed in the center of the raphal side, albumen ruminate; embryo exactly basal.

Palawan: Puerto Princesa (Mt. Pulgar), Province of Palawan, April 1911, number 12945.

Field-note:—A rather fine sprawling or subscandent climber; old stem 0.55 inch thick at the most, even thinner near the root, every flexible, terete, greenish on the exposed portions, otherwise yellowish, the leaf bearing part 1 inch through; sheaths densely covered with dull brown flattened spines 1 inch in length, otherwise greenish, subpersistent; leaves ascending and recurved, alternating every 5 to 8 inches, 5 feet long and terminating into a dangling 2 feet long clawed rachis; petiole 8 inches long, yellowish green, subcompressed, spiny, its base thickened and also spinescent especially along the margins whose spines are more numerous and twice as long; infrutescence subaxillary, recurved upon the short peduncle, all the stalks smooth and green, 1 foot long, finely branched, only the flattened peduncle spiny; fruits dark-green, less ellipsoid, shorter than 0.5 inch in length.

Very closely related to *Daemonorops Hystrix Mart.* of which it represents perhaps only a geographical form. It is a much smaller plant and is characterized by the three leaflet nerves being bristly on the upper side and along the midvein beneath. In *Daemonorops Hystrix Mart.* the leaflets have 3 to 5 nerves, all covered beneath with an almost uninterrupted line of very approximate small bristles. It differs also in its fruits having the scales in 15 vertical series. and in being rather deeply and neatly grooved along the center.

CALAMUS Linn.

Calamus mollis Blco. Fl. Filip. 264, 1837.

Field-note for 11969;—A relatively small rattan; old stem greenish brown, less than 0.5 inch thick, the greater length covered at least with dry persistent sheaths, leafy portion 0.75 inch thick, dark green; leaves alternating, 10 inches apart, horizontal, recurved toward the tip, 5 to 8 feet long; petiole 6 inches long, compressed, less than 0.5 inch wide, spinescent along the edges and especially beneath; rachis triangular from below the middle, provided with sharp recurved hooks or claws underneath; leaflets gracefully recurved, chartaceous, similarly green on both sides, flat except at the constricted base, spinescent on the margins and along the midvein on both sides; sheaths beset with 1 inch long usually grayish brown spines, those along the margins on the sheath more numerous or dense, suberect, twice as long and flattened; flagellum arising from the side of the leaf, strongly recurved, slender, as long or longer than the fronds, absent from the uppermost leaves, terete, the nether side provided with black claws; infrutescence arising from the sides of the uppermost leaves, at first ascending, finally recurved, a trifle shorter than the fronds, branches comparatively short and scattering, its spathes spinescent; fruits 0.33 to 0.5 inch in diameter, globose, pale white.

Mindanao: Todaya (Mt. Apo), District of Davao. May 1909, number 11969. Collected in dry jungled woods at 500 feet altitude several miles north of Digos.

Luzon: Irosin (Mt. Bulusan), Province of Sorsogon, August 1916, number 17052.

Calamus mollis palawanicus Becc. in Philip. Journ. Sci. II, 233, 1907.

Field-note:—A scandent and sprawling cane; stems few or several from the same root cluster, near the base 0.33 of an inch thick, 1 inch thick toward the top or leaf bearing portion, terete, greenish brown; leaves 5 inches apart on an average, gracefully recurved, alternate, 3 feet in length; leaflets descending but slightly, nearly equally green on both sides, somewhat folded upon the nether side, tough; petiole proper 4 inches long, flattened, 0.5 inch wide at the base which has a thickened perfectly smooth shoulder; sheath green, smooth or only prickly on certain parts, solidly enclosing the stem, ligule with scattering spines varying from 0.1 to 3 inches in length; rachis angular, with scattering solitary recurved black spines along the lower side; flagellum arising from opposite the leaf and a trifle below it, longer and much more recurved, sharply spinescent except toward the base; the inflorescence subterminal, arising similarly as to the flagellum in relation to the leaves; its branches yellowish green, quite rigid, strongly recurved, a foot apart, the spathes green and smoothish, the ligule finely spinescent; flowers creamy yellow even the calyx, fragrant, easily falling.

Palawan: Brooks Point (Addison Peak), Province of Palawan, March 1911, number 12607. In dry compact soil among shrubberies of cogonals near the seacoast. "Whoy" is the Tagbanua name.

Calamus Blancoi Kunth in Enum. Pl. III, 595, 1841.

Leyte: Palo, Province of Leyte, January 1906, number 7282. A widely ramifying and scandent rattan of the forest jungle. Stem one inch in diameter, looping. Leaves opposed by slender barbed recurved 'appendages. Inflorescence subterminal, similarly disposed and ending with a clawed appendage.

Calamus discolor Mart. in Hist. Nat. Palm. III, 212 and 341, 1849.

Field-note for 16871:—A looping climber; stem 0.6 inch thick, dull green; the sheathed portion twice as thick, densely covered with yellowish brown needle-like spines varying from 0.5 to 2 inches in length, more in the axial region and along the margins of the shoulders; leaves alternating every 6 or more inches; the 1.5 foot long petiole ascending or divaricate, 0.5 inch wide, compressed, brown on the nether side, sharply spiny along the upper side toward the base, the shoulder similarly beset with long needle-like spines; fronds recurved, 3 to 5 feet long; leaflets thinly chartaceous, chalky white beneath; hooked flagellum ascending from the base, arising few inches above the leaf axils, strongly recurved and 2 to 3 times as long as the fronds; infrutescence also exceeding the leaves, arising from near the axils, curvingly pendant, the relatively short fruit bearing branches alternatingly scattered from below the middle, widely scattered; the dull green sheaths spiny, especially so toward the base; ripe nuts less than 0.5 inch long, bluntly ellipsoid or narrower at the base, creamy white.

Luzon: Irosin (Mt. Bulusan), Province of Sorsogon, August 1916, number 16871. Gathered in jungled woods along a ridge at 2000 feet altitude. Lucban (Mt. Banahao), Province of Tayabas, May 1907, number 9299. Collected in a similar place.

Calamus filispadix Becc. in Philip. Journ. Sci. VI, 230, 1911.

Field-note for 13949:—A large tree climber and sprawling over their tops; naked canes 0.75 inch thick, terete, dark green, the leaf bearing portion curved, rigid, 1.5 inch thick; leaves alternating, 8 inches apart, strongly recurved, 5 feet long; petiole 0.75 inch wide at the base, 6 inches long, flattened, smooth beneath, spiny on the upper and lateral sides, the thickened shoulder smooth except the marginal sides; sheaths dark green but with dull brown flattened 0.75 inch long transversely arranged spines; leaflets recurved, tough or parchment-like, similarly green on both sides; infrutescence long and pendant, at least 3 times as long as the fronds but arising in their axils; the clawed flagellum arising in about the same place but much more recurved and also longer than the foliage; the fruit bearing branchlets divaricate; nuts or fruit less than 0.5 inch long, ellipsoidly globose, light cream color except the sharp apical brown tip and the margins of the scales.

Mindanao: Cabadbaran (Mt. Urdaneta), Province of Agusan, August 1912, number 13949. Collected on steep forested slopes near the summit of Duros peak at 4000 feet altitude. In Manobo it is called "Cangobnob."

Luzon: Irosin (Mt. Bulusan), Province of Sorsogon, August 1916, number 16846.

Palawan: Puerto Princesa (Mt. Pulgar), Province of Palawan, March 1911, number 12769. Apparently a smaller plant, gathered in alluvial flats covered with light woods at 500 feet altitude. It may perhaps be a distinct variety.

Calamus symphysipus Mart. in His. Nat. Palm. III, 336, 1849.

Field-note for 13902:—Looping climber; old stem portion lying on the ground green or glaucous green, round, at least 1.25 inch thick, hard; joints 2 to 3 feet apart; the leafy portion also green but covered with a glaucous brown bloom, nearly 2 inches thick; leaves alternatingly scattered every foot, 6 feet long, the shoulder plates at the base smooth, otherwise the sheath is provided with transversely arranged spines 1 inch in length and every inch apart; spines divaricate or when old descending, ascending when young; petiole proper 8 inches long, 1 inch wide across the green and smooth flattened upper surface, brownish scurfy beneath, spinescent along the lower side of the edges; infrutescence nearly opposite the leaves, ascending, as long as the leaves but more recurved; the fruiting branches alternate, a foot long or less, strongly recurved, subtended by smooth dry persistent spathes; branchlets ascendingly curved, lax and pale green; rachis ascending and ultimately recurved, clawed beneath; leaflets also recurved, rather limp but tough, glaucous or brownish scurfy beneath which is distinctly concolor, the whiplash-like very slender and clawed flagellum arising nearly opposite the leaves.

Mindanao: Cabadbaran (Mt. Urdaneta), Province of Agusan, August 1912, number 13902. Inhabiting dense woods or forests on steep slopes near the Catangan creek at 3000 feet altitude. Its vernacular name is "Bolanog" in Manobo.

Luzon: Irosin (Mt. Bulusan), Province of Sorsogon, July 1916, number 16701.

The leaves as is usual in that species terminate in gradually much reduced leaflets, these are elongate to lanceolate, gradually acuminate, covered on the lower surface with the characteristic subochraceous powdery coating as in the typical specimens from Celebes. The Mindanao specimens however have spathes of the spikelets very closely sheathing, whereas in the specimens from Celebes the same spathels are somewhat loosely infundibuliform. In every other respect but especially in the characteristic pedicellate fruits, the plant from the Philippines is identical with that of the Celebes.

This size of rattan is much used locally in the construction of chairs. These however are of a more or less inferior kind, probably because of a lack of the proper tools, machines and workmanship. This same grade is also used to make pack saddles for horses and carabao. At Lucban I have seen these animals brought into rattan workshops for the saddler to take their proper measure for a saddle. The idea was a good one, but the finished article was very crude and more often a misfit.

Calamus Cumingianus Becc. in Rec. Bot. Surv. Ind. II, 210, 1902.

Field-note:—Scandent; old stem 0.5 inch thick, hard, green, 30 to 50 feet long, leaf bearing portion short, usually curved, 1.5 inch thick, glaucous green or otherwise dull green, the sheaths smooth; leaves alternatingly scattered every 8 inches, 1 to 2 yards long, gracefully recurved and occasionally a trifle twisted, its rachis clawed beneath but not extended; hooked flagellum arising from opposite the leaves and exceeding them; leaflets horizontal, concave beneath, tips abruptly recurved, deep green on both sides, papyraceous, extending clear to the base, much reduced toward the ends; infrutescence leaf opposed, slightly longer than the foliage, recurved or subpendant, the green spathels sparingly apiculate, branches alternating, the larger or lower ones from below the middle; fruits pale green, the green stalks curved.

Mindanao: Cabadbaran (Mt. Urdaneta), Province of Agusan, August 1912, number 13646. Gathered in moist stony ground of jungled woods along the Catangan creek at 750 feet altitude. "Dowung-dowung" in Manobo.

Mr. Elmer's plant of *Calamus Cumingianus Becc.*, was based on *Cuming* 762 and with which however a rigorous comparison is difficult, owing to the incompleteness of the latter. On *Elmer's* specimens the leaf sheaths are 4 to 5 cm. thick and are quite smooth or unarmed, the leaves terminate in gradually much reduced leaflets; these are narrowly oblong, somewhat concave underneath and inflated in their upper portion, are green on both sides but paler so beneath and quite devoid of any kind of a powdery coating. The partial inflorescences have the lower spikes divided into smaller spikelets; the fruits are small and globose, pedicellate like those of *Calamus symphysipus Mart.* but with shorter pedicels.

Calamus Elmerianus Becc. in Leafl. Philip. Bot. II, 647, 1909.

Field-note for 14166:—A scandent and sprawling vine; stem terete, green, flexible, as thick as an ordinary lead pencil, 0.5 to 0.75 inch thick along the leaf bearing portion, its joints very fine; leaves alternatingly scattered every 8 inches, recurved, their rachis extended into a much recurved hooked tail; leaflets about 5 pairs, 3 inches apart, the basal pair usually smaller and near the base, parchment-like, dull green on both sides, apex strongly recurved, concave on the under side, the petiole shoulder smooth but its sides spiny; sheath dark green, provided with 0.5 inch long sharp yellowish green divaricate spines; infrutescence as long as the leaf, ascending upon the spiny peduncle, the 2 or 3 branched portions from above the middle and similarly recurved; mature fruit nearly sulphureous, subglobose, 0.33 inch long, the bract margins reddish brown, the mucronate point similar in color.

Mindanao: Cabadbaran (Mt. Urdaneta). Province of Agusan, October 1912, number 14166. Collected in jungles, among humid forests bordering a lagoon at 5000 feet altitude. Its Manobo vernacular name is "Sababay." Todaya (Mt. Apo), District of Davao, May 1909, number 11756. Found under similar conditions at an equal altitude, and was called "Samanid" by the Bagobos.

Luzon: Lucban (Mt. Banahao), Province of Tayabas, May 1907, number 9298 or the type specimen.

It is the smallest rattan known in our islands, and is confined to humid forested alpine regions. Between the lagoon at 5000 and the summit of mount Urdaneta at 6000 feet altitude, it is quite common. Every where in the dense jungle undergrowth of the moss laden forests, their stems dangle about like so many coarse wires. They are not very long andusually there are few to several or even numerous from each root cluster, either sprawling in habit or ascending and climbing, and their old sheathless portion is no thicker than ordinary slate pencils. These canes are very flexible and strong, and because of their evenness and small size, are very much sought by the wild people for fine rattan work.

Calamus manillensis (**Mart.**) **Wendl.** in Kerch. Les Palm. 237, 1878. *Daemonorops manillensis Mart.* in Hist. Nat. Palm. III, 330, 1849.

Field-note for 11714:—A looping climber; old stem or cane 1 to 2 inches thick, hard, smooth, deep or somewhat glaucous green, the leaf bearing portion at least 3 inches thick; sheaths dull green, evenly and promiscuously covered with comparatively short irregularly scattered dull brown spines; fronds horizontal, toward their distal ends recurved, 10 feet long. terminated by an equally long clawed and angular flagellum; rachis below the middle smooth beneath and spinescent above, toward the apex smooth above and hooked beneath; petiole proper 1.5 foot long. flattened, 1.5 inches wide at the base; leaflets ascending from the base, soon recurved or descending, tough and similarly dull green on both sides, rather evenly scattered; infrutescence ascending, finally recurved, axillary, 5 feet long, dull deep green and becoming covered in places with a copper brown coating, branched from below the middle; spathes spinulous; the branches freely rebranched into 6 inches long curved ultimate fruit bearing spikes; fruits nearly globose, 0.5 in diameter, shining light green except the brown margined scales.

Mindanao: Todaya (Mt. Apo), District of Davao. July and June 1909, numbers 11714 and 10560ª. Both numbers were collected in dense oak forests at 4000 feet altitude and where they climb over the tallest of trees. The former was called "Sarani" by the Bagobos and the latter "Lintocan" by the same natives. Cabadbaran (Mt. Urdaneta), Province of Agusan, October 1912. numbers 14011, 14133 and 14173. All these were gathered in the forests between 3000 and 5000 feet altitude. The Manobos called the first number cited "Bunlac", the middle number "Tumarom" and the last "Bayabong."

Luzon: Irosin (Mt. Bulusan), Province of Sorsogon, July and August 1916, numbers 16811 and 17077. In alpine forests between 2000 and 3500 feet altitude.

This species is one of a number of the larger kind usually met in the higher forests of our mountainous regions. The stem of these attain great lengths, the longest of which so far known is toward 700 feet. On the ground they lie about in snake-like fashion, then forming a series of large loops which finally lead into the branches and foliage of the trees—and when one can get a glimpse over the tallest of our forest trees, one can see the terminal leafy portion of these rattans stand out above the forest canopy as staffs into the clear bright air. I have often wondered how much higher they really would climb, or how many years it took them to climb to such heights, and in what manner? The basal loops on the wet ground partially covered with old humus can always be depended on to contain a sufficient quantity of water to satisfy the parched mountaineer. That portion of the same stem hanging above ground contains much less water. Sections of the stem from one to five yards long are slantingly cut and tilted up so as to allow the flow to be received into one's mouth. The most and best flow comes from a long stick, and for the sake of convenience, the upper end of which should be placed up against a tree. Its clear water usually has a trifle sweet taste and leaves no bad effect.

Calamus Moseleyanus Becc. in Rec. Bot. Surv. Ind. II, 211, 1902.

Field-note:—A medium sized climber; canes or sheathless stem 1 inch thick, green, hard, smooth toward the base and where it is one half as thick, its leafy portion 2 inches thick; fronds alternatingly scattered, 1 foot apart, 8 feet long, extended into a 4 feet long clawed flagellum, divaricate or slightly ascending, recurved toward the end; petiole shining green, 6 inches in length, spiny on the upper side and along the edges, the basal green shoulder smooth; leaflets descending, chartaceous, similarly green on both sides, deeply concavo-convex ventrodorsally, abruptly reduced at both ends but more scattering toward the apex; inflorescence arising several inches below the leaf axils, ascending at the base, finally much recurved, 6 feet long, widely and alternatingly branched from near the base; the branchlets ascending and recurved, its largest spathe with a few spines along the edges or keels; flowers yellowish green.

Mindanao: Todaya (Mt. Apo), District of Davao, May 1909, number 11886. Collected on a dry forested ridge at 3500 feet altitude on the southern or Talon side of the mount Apo range. The Bagobo name is "Sarani."

Calamus ornatus philippinensis Becc. in Webbia I, 346, 1908.

Field-note for 11236:—A stout climber; stems few clustered, the leafy portion 3 to 5 inches thick, its canes less than one half as thick; coarse leaves 10 feet in length, horizontal and recurved, alternatingly scattered every foot; leaflets similarly disposed; the hooked rachis leaf opposed, 20 feet long, flattened and 0.75 inch wide at the base and covered along the lower or clawed side with a dense grayish brown bloom; leaf stalk or petiole ascending, 2 feet long, nearly 2 inches wide at the base, similar in shape and indumentum beneath as that of the dangling flagellum, smooth, at the base hard and with a much thickened shoulder; sheath tightly enclosing the stem, dark green, but covered with the same sort of a coating, beset with 1 inch long much flattened spines which are divaricate and arranged in tranverse rows; infrutescence at first ascending, finally recurved, its 2 or 3 fruited clusters 3 to 5 feet apart, the green spathels spinescent below, the rachis extended into a slender much recurved spiny tip; the whole fruiting cluster strongly recurved, its branches green and smooth, 1 to 2 feet long, the branchlets 1 to 3 inches long, ascendingly curved along the upper side; nuts 0.75 inch long, ellipsoid, the prominent apex nearly black as are also the tips of the greenish finally yellow scales.

Mindanao: Todaya (Mt. Apo), District of Davao, May 1909, number 11236. In dry woods at 1500 feet altitude. Its native or Bagobo name is "Tubo."

Luzon: Irosin (Mt. Bulusan), Province of Sorsogon, December 1915 and September 1916, numbers 15607 and 16886 respectively. Lucban (Mt. Banahao), Province of Tayabas, May 1907, number 7625.

This is quite common in the woods and forests about Irosin, and is called "Calape" by the Bicolanes. The natives in other parts of Luzon also call it by that same name, and in central Samar there is a town by the name "Calape". Its deep cream colored fruits when ripe are juicy and vinegar sour. The natives of Sorsogon province are very fond of it, and in the fruiting season it is extensively collected and brought into the local markets for sale. A bunch or hand costs five to ten centavos according to its size. Because of the difficulty in getting at the fruit clusters, the natives cut the stem near the ground and pull the plant with the fruits down for its ripe bunches. Usually every infrutescence bears both ripe and unripe clusters, and in many cases there is more than one infrutescence on the same plant. Again, instead of utilizing the stem by cutting it into rattan strips, it is wastefully discarded.

Calamus bicolor Becc. in As. Palms, Ann. Roy. Bot. Gard. Calc. XI, Suppl. 126, t. 73.

Field-note for 10541:—A lofty tree climber; stem toward the base 0.75 inch thick, forming large loops, toward the foliage 3 to 5 inches thick; fronds ascending, alternate and spirally arranged, 10 feet in length; the extended rachis about one half as long, spinescent, otherwise triangularly flattened, hard, green, clawed beneath in addition to the spines, along the upper side sharply spinescent; sheaths densely covered with needle like 1 to 3 dull brown somewhat flattened spines; leaflets reduced toward the apex and base, the basal 1 foot of the stalk leafless, deep green above, ashy gray or glaucescent beneath, spinescent along the margins; infrutescence 2 feet long, 6 inches thick, upon 2 to 5 feet long flattened sharply spiny green stalks arising from the upper leaf axils, erect or nearly so from the base; fruits green.

Mindanao: Todaya (Mt. Apo), District of Davao, May 1909, numbers 10541 and 10618. The former number was collected south of the Sibulan river in the oak forests at 4250 feet altitude, and was called either "Lassee" or "Rassee" by the Bagobos. The latter number was found in a jungled forest at 6000 feet altitude of mount Calelan, and was called by the same natives "Sambonotan." Number 10618 is a much smaller and finer plant.

Calamus dimorphacanthus Becc. in Rec. Bot. Surv. Ind. II, 214, 1902.

Luzon: Baguio (Mt. Santo Tomas), Province of Benguet, May 1904, number 6238.

Calamus microcarpus Becc. in Rec. Bot. Surv. Ind. II, 213, 1902.

Field-note for 13551:—A tall tree climber; stem long and looping, no thicker than 0.5 inch toward or at the base, hard and green, at least 2 inches thick at the leaf bearing portion; leaves alternatingly scattered every 6 inches, 6 feet long or longer, the basal 1 foot leafless, recurved, their rachises extended into hooked strongly recurved flagellae; leaflets similarly recurved, shining green on both sides, submembranous, finely spinescent on the upper surface; sheaths green but covered with a glaucous white layer, densely ringed with spines even the shoulders; infrutescence axillary, strongly recurved, rather rigid, the 1 foot long peduncle well covered with dry sparsely spinescent spathes, the fruit bearing portion a yard long, minor stalks green and curved; fruit pale green, globosely ellipsoid, 0.35 inch long.

Mindanao: Cabadbaran (Mt. Urdaneta), Province of Agusan, August 1912, number 13551. Collected in moist forested flats at 750 feet altitude. The Monobos called it "Pagipi." Todaya (Mt. Apo), District of Davao, May 1909, number 10676. On a densely wooded ridge along the Baruring river at 3500 feet altitude. The Bagobo name is "Pareti."

Luzon: Irosin (Mt. Bulusan), Province of Sorsogon, December 1915 to July and August 1916, numbers 15573, 16810 and 16991 respectively.

Calamus siphonospathus Mart. in Hist. Nat. Palm. III, 342, 1849.

Field-note:—A lofty tree climber; stem looping, smooth, hard, green, 1.5 inches thick, the leafy portion at least twice as thick; fronds scattered alternatingly, ascendingly or horizontally spreading and recurved toward their ends, 8 feet long or shorter, terminated by a hooked rachis; petiole at least 2 feet long, subcompressed, 1 inch wide across the base, densely covered with spines on both sides; rachis triangular or more flattened beneath and also more spinescent; leaflets submembranous, similarly green on both sides but more spinulous along the upper surface, horizontal and recurved; spines varying on the sheaths from 0.5 to 1.5 inches long, dull gray, flattened, arranged in oblique rows, their bases yellowish; inflorescence 3 to 5 feet long, its spathes green and smooth; branchlets recurved, also smooth and green, gradually reduced toward the apex; fruits said to be nearly mature.

Mindanao: Todaya (Mt. Apo), District of Davao, May 1909, number 11652. Gathered in heavy forests at 4000 feet altitude. The natives or Bagobos called it "Oban-oban." Possibly only a form of *Calamus microcarpus Becc.*

Calamus Merrillii Becc. in Webbia I, 347, 1905.

Field-note for 11885:—Scandent upon lofty trees; old stems 2.5 inches thick, hard, green or occasionally glaucescently green, the sheathed portion nearly 4 inches through; leaves divaricate or slightly ascending and recurved, alternatingly 1 foot apart, 10 feet long, terminated into a subpendant powerfully clawed rachis one half as long; leaflets descending, sublucid and similarly green on both sides, both surfaces provided with scattered setae-like spines, the midrib keeled on the upper surface and with sloping sides, tough or not rigid, reduced toward the apex; petiole proper 1.5 foot in length, glaucous green beneath or on the sides toward the base, 2 inches wide, concave above, convex below, smooth except the spiny edges, the basal thick shoulder smooth; sheaths covered with a dingy reddish white bloom or pulverulence, especially spiny beneath the thick petiole bases; the spines range from 0.25 to 3 inches in length, on an average short below, longest along the ligulate top of the sheath; infrutescence axillary, ascending and finally much recurved, about 4 feet long, all the spathels dull green and spinescent; branches alternating, 3 to 5 inches apart, the lower ones 2 feet long, gradually reduced toward the apex; the fruit bearing branchlets 3 to 5 inches in length, ascendingly curved as are also the secondary ones; fruits globose or a trifle elongated, 0.5 inch long, pale green or whitish.

Mindanao: Todaya (Mt. Apo). District of Davao, May 1909, number 11885. On a forested ridge at 3500 feet altitude, on the Talon or southern sector of the mountain, in moist fertile humus covered soil. "Acab-acab" in Bagobo. Cabadbaran (Mt. Urdaneta), Province of Agusan, August 1912, number 13926. In rich damp soil of forested flats among hemp fields along the Minusuang river at 500 feet altitude. A very coarse and practically worthless rattan. The Manobo name is "Palasan."

The Todaya plant represents an intermediate form between the typical one from Luzon and the variety *Calamus Merrillii Merrittianus Becc.* of Mindoro.

Calamus Merrillii nanga Becc. in As. Palms, Ann Roy. Bot. Gard. Calc. XI, Suppl. 78, t. 42.

Field-note for 11874:—A coarse high tree climber; old stem 3 inches thick, hard, green, smooth, leaf bearing portion 5 inches thick; leaves alternating every foot or more apart, divaricate or ascending below the middle, otherwise recurved, 15 feet long, extended into as long and powerfully clawed subpendant rachises; petiole about 3 feet long, compressed, 2 to 3 inches wide, smooth and yellowish on the upper shallowly concave surface, spinescent along the edges on the sides especially toward the base, convex beneath; rachis smooth on both sides except the hooks on the nether side toward the distal end, its upper edges spinescent below the middle; leaflets hanging or rather descending, more or less concave on the lower side toward the base, bright green on both sides and with scattered setae-like bristles, the midvein conspicuous on the upper surface, not rigid but quite tough; old infrutescence ascending from the leaf axils, the distal part much recurved, 5 feet in length; the branches ascendingly curved, alternate, 3 to 5 inches apart, the basal ones larger, all similarly rebranched; spathels green, covered with a yellowish brown pulverulence.

Mindanao: Todaya (Mt. Apo), District of Davao, May 1909, numbers 11874 and 11110. Collected in jungled wooded gulches between 2000 and 3500 feet altitude. Both numbers were called "Nanga" by the Bagobos.

Calamus melanorhynchus Becc. in As. Palms, Ann. Roy. Bot. Gard. Calc. XI, Suppl. 30, t. 16.

Field-note:—A looping lofty tree climber; old stem smooth, hard, green, 0.75 inch thick, the sheathed portion 2.5 inches through; leaves alternatingly scattered along the upper one third of the length of the stem, basal portion ascending but otherwise recurved, 6 feet long; petiole 1 foot in length, flat on the upper side, convex below, 1 inch across the base, more spinescent beneath; leaflets strongly recurved, shining on both sides, somewhat paler green beneath, the margins more or less subinvolute, chartaceous; flagellum 25 feet long, arising subopposite the leaves, roundly flattened toward the base, terete otherwise, provided with especially stout hooks along the lower side except toward the base, strongly recurved and pendant or drooping; old persistent inflorescence similarly disposed and upon equally long stalks from nearly opposite the leaves; the hanging branches bearing the spikes nearly smooth, about 3 feet apart; the basal one arising 10 feet from the base of the rachis, 3 to 5 feet in length, the uppermost ones only 1 foot long; spathels dark green, densely covered with 1 inch long or shorter stout flattened brown spines more or less transversely arranged.

Mindanao: Todaya (Mt. Apo), District of Davao, June 1909, number 11708. Discovered in humid forests at 4000 feet altitude, south of the Sibulan river. Its vernacular Bagobo name is "Dalimban."

Calamus samian Becc. in As. Palms, Ann. Roy. Bot. Gard. Calc. XI, Suppl. 92, t. 52.

Field-note for 11336:—Scandent and looping; stems 0.5 inch thick, smooth and green, the leafy portion 1.5 inch through; leaves descendingly curved, leaflet bearing to within 6 inches from the base, 7 feet long and extended into a 3 to 5 foot long clawed rachis; petiole flattened, 1 inch wide, spiny on both sides but especially on the upper surface; rachis also spiny on both sides yet chiefly hooked beneath toward the end; leaflets recurved, similarly green on both sides and membranous, spinescent along the edges and on the midrib above; sheaths alternating every 8 inches, spiny except at the base and the thickened portion of the petiole base; infrutescence ascending and recurved, 1 foot long, arising some distance above the leaf axils; the main stalk compressed and spiny, alternatingly rebranched; its fruit bearing branchlets glabrous, recurved, 1 to 2 inches long; fruits whitish, glaucous, 0.5 inch in diameter.

Mindanao: Todaya (Mt. Apo), District of Davao, July 1909, number 11336. Discovered on a steep forested ravine near a ridge at 4500 feet altitude of mount Calelan. The Bagobo name is "Samian."

Luzon: Irosin (Mt. Bulusan), Province of Sorsogon, September 1916, number 17255.

Calamus viridissimus Becc. in As. Palms, Ann. Roy. Bot. Gard. Calc. XI, Suppl. 84, t. 47.

Field-note:—A medium sized tree climber; stem 1 inch through, the greater upper portion covered with sheaths and leaves, the leafy portion 1.5 inch thick; leaves alternate, nearly 1 foot apart, ascending though finally recurved, 5 feet long, extended into a yard long clawed rachis; leaflets tough, smooth and shining on both sides, ascending from the base, otherwise strongly recurved and drooping, deep green on both sides, extending clear to the base, more or less reduced at both ends but scattering toward the apex; rachis flattened, dark green, spiny on the upper side below the middle, on the lower surface above the middle provided with recurved hooks, fully 0.6 inch wide at the base; sheaths dull green, provided with similarly colored sharp spines averaging 0.5 inch long; infrutescence arising a few inches above the leaf axils, ascending and then recurved, 3 to 5 feet in length, freely rebranched from near the base, only the crest of the spathels beset with a few spines.

Mindanao: Todaya (Mt. Apo), District of Davao, July 1909, number 11938. Discovered in wooded ravines or gulches at 1000 feet altitude. "Acal" is its Bagobo name.

Calamus multinervis Becc. in As. Palms, Ann. Roy. Bot. Gard. Calc. XI, Suppl. 88, t. 49.

Field-note for 11791:—A looping climber; the cane or old stem 1 to 1.5 inch thick, dark or olive green, hard, 3 inches across at the sheaths; frond ascending except the distal recurved portion, alternatingly scattered along the upper one half of the stem, 1 foot or more apart, about 6 feet long, terminated by as long a hooked flagellum which droops in a curving manner; leaf sheaths deep or dull green, entirely smooth; leaflets strongly recurved, similarly deep green on both sides, sublucid, tough and papyraceous; petiole proper 6 inches long, compressed, at least 1 inch wide, spinescent along the edges, otherwise smooth; rachis also smooth except the claws along the lower side toward the tip or flagellum; inflorescence arising a few inches above the leaf axils, about 5 feet in length, alternatingly rebranched, the peduncle proper 1.5 foot long; branches ascendingly curved as well as the whole inflorescence, the basal ones 1.5 foot long, gradually reduced toward the apex; spikes 1 to 3 inches long, bearing the flowers or fruits in 2 alternating rows; its green spathels with a few hooked spines along the keel.

Mindanao: Todaya (Mt. Apo), District of Davao, May and July 1909, numbers 11791 and 11955 respectively. The former number was discovered in moist rich soil of a densely forested flat south of the Baruring river at 4000 feet altitude. The Bagobos called it "Ubble." The latter was found under the same ecological conditions, but it was called "Balala" by the same natives.

Calamus megaphyllus Becc. in As. Palms, Ann. Roy. Bot. Gard. Calc. XI, Suppl. 66, t. 35.

Field-note for 11878:—A coarse climber; stem 1.5 inches thick at the leaf bearing portion, one half as thick in the smooth cane portion; fronds 1 foot apart, alternate, divaricate or only slightly ascending, recurved toward their tips, 5 feet long, terminated into a stoutly clawed subpendulous rachis equalling the leaves; leaflets irregularly clustered, extending clear to the base, sublucid on both sides, gracefully recurved, similarly pale green on both sides, smooth, tough or not rigid, convex on the nether side; rachis sharply spiny, smooth on the upper side above the middle, the basal portion of a thick smooth shoulder; sheaths green but usually covered with a grayish coat, smooth or sometimes with a few spines along the upper part opposite the leaf; infrutescence pendulous, arising a few inches above the leaf axils, 4 feet long; its spathels green and provided with a few recurved spines; the branches scattered, 6 to 10 inches apart, only 6 inches long or shorter toward the apex; the fruit bearing branchlets ascendingly curved; fruits pale green, globose or a trifle longer, fully 0.5 inch thick.

Mindanao: Todaya (Mt. Apo), District of Davao, June 1909, number 11878. Discovered in open light woods or secondary forests of bench lands in the Talon mountain range south of Apo at 3000 feet altitude. This as well as *Calamus manillensis (Mart.) Wendl.* the Bagobos called "Lintocan." Cabadbaran (Mt. Urdaneta), Province of Agusan, August 1912, number 13542. "Banacbo" in Manobo.

Calamus vinosus Becc. sp. nov.

Caudice vaginato 4-4.5 cm. diam.; vaginis in parte basilari nudis, superne spiculis rigidis subpungentibus, ad faucem densioribus, indutis; foliorum segmentis numerosis, subequidistantibus, tenuiter pluricostulatis, anguste, lanceolatis, longe acuminatis, secus nervos in parte apiculis ad margines omnino nudis; cirro validissime eculeato; spadice paniculato, apice breviter, caudiculato; spicis crassiusculis, majoribus 8-10 cm. longis, floribus fem. ad spathellas geminatis, flore neutro interposito addito; fructibus ovoideo-ellipticis; semine lenticulare, albumine homogeneo.

Scandent, rather robust, the sheathed stem 4 to 4.5 cm. in diameter. Leaf sheaths strongly gibbous above, brown and closely dotted with minute radiating whitish scales, smooth in their lower more or less exposed part, densely covered above with scattered rigid or subspiny bristles, the latter becoming very crowded on the margins of the very obliquely cut mouths. Leaves large, about 2 m. long in the pinniferous part; petiole short and robust, 3 cm. broad at its strongly flattened base, flat and spiny on its upper surface, convex beneath; the margins bluntish and also armed with short spines, the rachis in its first portion is also rounded beneath and has the upper face flat and sprinkled with short erect spines, while the sides are flattish, further up the rachis is convex above or has the salient angle obtuse and never sharp, not even so toward the end; beneath in the upper portion it is armed with robust claws, at first solitary, then confluent in groups of 2 to 5; the cirrus is very robust, about 1.5 m. long, very powerfully and regularly armed with half or three quarter whorls of very stout claws. Leaflets numerous, the intermediate leaflets 38 to 40 cm. long, 3.5 to 4 cm. broad, subequidistant, 5 to 8 cm. apart on each side of the rachis, elongate to lanceolate, tapering from above the middle to a rather acute base, toward the distal end gradually long acuminate to subulate and with quite bristleless tip; they are firmly papyraceous, green and quite glabrous and spineless on both surfaces, shining above, dull and very slightly paler on the nether side; the midcosta is very slender and somewhat stronger than the 2 or 3 pairs of lateral nerves, the latter only a trifle more conspicuous than the secondary intermediary ones, transverse veinlets numerous, very sharp and much interrupted, margins quite smooth. Female spadix shorter than the leaves, robust, rigid, it forms a diffuse and large panicle about 1.5 m. long or longer, nonflagelliferous at the apex, ending in a very short caudiculum; it is composed of several gradually diminishing spike bearing partial inflorescences and is borne on a short peduncular stalk; peduncle 15 cm. long, smooth, flattened, acutely 2-edged, 2 cm. broad; primary spathes coriaceous, tubular, very slightly enlarged above, yet very closely sheathing throughout, acutely 2-edged on the axial side in the lower part, only prickly near the mouths which are truncate and produced at one side into a triangular dorsal prickly and keeled point; partial inflorescences inserted just at the orifices of their respective spathes; the lower partial inflorescences somewhat reduced in length and number of spikelets; secondary spathes more or less 3 cm. long, very narrowly infundibuliform, smooth, truncate at their mouths and produced above on one side into a broadly triangular point; spikelets thickest and inserted just at the mouths of their respective spathels; the lower and larger spikelets 8 to 10 cm. long, with 8 or 9 pairs of flowers on each side, the others gradually shorter and with fewer pairs of flowers; spathels infundibuliform, truncate, 6 to 7 mm. wide at their mouths, produced on one side into a short but broad triangular point, involucrophorum inserted just at the mouths of their respective spathels, very short and scale-like or bracteiform, shortly bidentate and 2-keeled on the side next to the axis, embracing 2 equal female flowers, each of which is provided with its own orbicular shallowly cupular involucre; between the 2 involucrae is a distinct elliptical areola for the insertion of a neuter flower. Fruiting perianth about 3 mm. in length, distinctly pedicelliform, the hardened calyx is somewhat broadened at the base. Fruit ovoidly ellipsoid, equally rounded at both ends, 16 to 18 mm. long, 12 to 14 mm. through, very shortly beaked at the apex and upon a short caudiculate base; scales subsquarrose, not quite appressed, arranged in 12 vertical series, glossy, slightly convex, not deeply grooved along the center, of a reddish brown color when dry, the apex slightly produced and more or less tinged with purplish red as are frequently the margins, when fully mature wine red. Seed enveloped by a copious fleshy acid integument, somewhat irregularly flattened, lenticular, 8 mm. broad, 4 mm. thick; the chalazal fovea punctiform on the center of one of the faces. Albumen homogeneous.

Mindanao: Cabadbaran (Mt. Urdaneta), Province of Agusan, October 1912, number 14158. Discovered this alpine rattan in rocky though moist ground of deep forested and sheltered ravines near the summit ridge of Cawilanan peak at 4750 feet altitude. Its large infrutescence loaded with ripe red fruits could be seen long distances. The native Manobo had no name for this our most characteristic of our Philippine species, or the only red fruited rattan known.

Field-note:—A middle sized tree climber; leaf bearing stem 2 inches thick, very dark green; leaves alternatingly scattered every 8 inches, horizontal and recurved, their rachises extended into dangling hooked flagellae, the leaflet bearing portion 6 feet in length; petiole 1 foot long, 1 inch wide, flat and spiny on the upper side and along the edges, the thickened plate quite smooth; sheaths provided with bristle-like spines which are denser and longer toward the top or along the margins; leaflets chartaceous or rather parchment-like, very strongly recurved or pendant, shining above, a trifle paler beneath; infrutescence arising from near the leaf axil, more or less recurved, 3 to 5 feet long or longer, quite rigid, the rachis compressed toward the base; spathels smooth except the fringe of bristle-like spines toward the throat; branches alternating every 4 inches, divaricate and slightly recurved, rebranched, the fruit bearing segments a trifle ascending; nuts upon short green pedicels, short ellipsoid, very bluntly pointed at the apex, 0 5 inch across, vinosus, the scale margins of a darker wine color; its mature meat is very sour though juicy.

This well characterized species is apparently related to *Calamus multinervis Becc.*, offering the very uncommon and characteristic feature of two female flowers at every spathel with a neutral one interposed, and of its ripe fruits being wine red.

Key to the genera. *

1. Leaves bipinnate or decompound. 1. *Caryota.*
1. Leaves orbicular, their segmented portions free or plicately united.
   2. Monocarpic palms with dull or grayish green leaves; inflorescences terminal. 2. *Corypha.*
   2. Polycarpic palms with bright green leaves; inflorescences axillary.
      3. Blades divided into radiating segmented portions, which are praemorse at their tips. 3. *Licuala.*
      3. Blades plicately united, except the free apical segments which are not praemorse. 4. *Livistona.*
1. Leaves pinnate or compound.
   2. Climbing palms with flagellae, the leaf rachis beneath with recurved claws.
      3. Leaflets rhomboid or wedge shaped; leaf sheaths usually inflated and inhabited by ants. 5. *Korthalsia.*
      3. Leaflets never rhomboid nor wedge shaped; leaf sheaths not inflated nor inhabited by ants.
         4. Monocarpic palms; the elongated and drooping branches of the inflorescence with broad over-lapping bracts concealing the flowers. 6. *Plectocomia.*
         4. Polycarpic palms; branches of the inflorescence relatively short, not drooping nor with broad flower concealing bracts.
            5. Spikes in the axils of large, open and deciduous spathels, leaving annular vestiges after falling; flagellum always from the end of the rachis. 7. *Daemonorops.*
            5. Spikes in the axils of tubular or funnel shaped and persistent spathels; flagellum from the end of the leaf rachis or from the leaf sheath. 8. *Calamus.*
   2. Palms with stems or acaulescent, never flagellate nor the leaf rachis clawed.
      3. Fruits scale covered.
         4. Acaulescent palms. 9. *Zalacca.*
         4. Caulescent palms.
            5. Monocarpic trees with erect terminal infrutescence. 10. *Metroxylon.*
            5. Polycarpic trees with axillary recurved infrutescence.

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* This key, prepared by *A. D. E. Elmer*, is based mainly on vegetative characters including a few habitats. A dozen additional introduced genera have been omitted, because they have not yet borne flowers.

6. Upper edge of the rachis and midribs antorsely spiny. 11. *Raphia.*
6. Edges of the rachis and midribs smooth. 12. *Coelococcus.*

3. Fruits not scale covered.
  4. Palms confined to saline swamps; peduncle arising from the rhizomes. 13. *Nipa.*
  4. Dry land palms; peduncles arising from the leaf axils of the stem.
    5. Palms with spines, either on the petioles or on the leaves and stem.
      6. Stems as well as the petioles spiny.
        7. Leaflets linear, pointed and split at the apex. 14. *Oncosperma.*
        7. Leaflets cuneately elongated, irregularly toothed at the broad apex. 15. *Martinezia.*
      6. Edges of petioles only spiny.
        7. Leaflets duplicate; infrutescence in a subglobose head. 16. *Elaeis.*
        7. Leaflets induplicate; infrutescence branched. 17. *Phoenix.*
    5. Palms without spines, except the splinter like fibers or bristles of *Arenga.*
      6. Inflorescence borne below the leaves whose bases form a tight green boot-like sheath.
        7. Trunk even or smooth, the mature ones swollen above the middle, the uppermost leaf scars well separated and gray or chalky white. 18. *Oreodoxa.*
        7. Trunk uneven or annular especially toward the top, cylindric throughout, the uppermost leaf scars closely set, not grayish white.
          8. Primary branches of inflorescence unbranched; fruits closely set in distichous rows. 19. *Pinanga.*
          8. Primary branches of inflorescence rebranched; fruits scattered, not in distichous rows.
            9. The slender and terminal branchlets staminate, or sometimes the entire inflorescence male 20. *Areca.*
            9. Male and female flowers scattered or intermixed throughout the inflorescences.
              10. Leaflets toothed at the broadened truncately oblique or concave apex. 21. *Ptychosperma.*

10. Leaflets pointed at the apex which is entire, split or minutely toothed.
    - 11. Fruit ovoid, 5 to 8 cm. in length. 22. *Actinorhytis.*
    - 11. Fruit globose or ellipsoid, less than 3 cm. long.
        - 12. Stems clustered, usually curved and green toward the top. 23. *Cyrtostachys.*
        - 12. Stem solitary, straight and dull brown.
            - 13. Flowering branches long, pendant; male flowers small, with 6 or 9 stamens. 24. *Archontophoenix.*
            - 13. Flowering branches short, divaricate; male flowers large, with 30 stamens. 25. *Adonidia.*

6. Inflorescence borne in the axils of the leaves whose bases do not form a tight green boot-like sheath.
    - 7. Fruit exceeding 15 cm. in diameter. 26. *Cocos.*
    - 7. Fruit never exceeding 10 cm. thick.
        - 8. Leaflets irregularly toothed at the blunt apex, lobulate at the constricted base; inflorescence once branched. 27. *Arenga.*
        - 8. Leaflets pointed and split at the apex, sigmoid at the base; inflorescence twice branched.
            - 9. Fruit 5 to 8 cm. in diameter. 28. *Orania.*
            - 9. Fruit less than 3 cm. long.
                - 10. Leaves 3-ranked, the expanded base glaucous; introduced. 29. *Dypsis.*
                - 10. Leaves imbricate, the expanded base not glaucous; indigenous.
                    - 11. Ripe fruit globose. 30. *Heterospathe.*
                    - 11. Fruit ovoid or ovately ellipsoid. 31. *Ptychoraphis.*

LEAFLETS OF PHILIPPINE BOTANY

EDITED BY A. D. E. ELMER, A. M.

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NEW WOODY PLANTS from MOUNT MAQUILING

by

A. D. E. Elmer

ANNONACEAE

Papualthia bakeri Elm. n. sp.

An erect small tree. Stem 3 dm. thick, numerously branched above the middle; young twigs brownish, sparsely hairy, glabrous and blackish brown when old. Leaves alternate, copious, oblong or the smaller ones broadly lanceolate, acute to acuminate, base broadly rounded, the average blades 3 by 10 cm., subsessile or upon very short thick petioles, paler green beneath, submembranous, glabrous except the few hairs on the lower side toward the base; midrib conspicuous, usually strigose, with 7 to 10 very obscure divaricate pairs of nerves which are scarcely more prominent than the reticulations; bud bract and very young leaf yellowish brown hirsute. Flower solitary and terminal, cremeous; pedicel 3 cm. long, slender, brownish, glabrate except toward the few bracteate base, gradually thickened toward the distal end; calyx 8 mm. across, punctate or granular, thick, broadly or triangularly 3-toothed, nearly glabrous; petals united below, the 6 segments in 2 series, 2 cm. long or considerably shorter, equal in size and shape or the inner series somewhat narrower, similar in texture, glabrate except the outer basal portion and along the margins, oblong, obtuse; torus 3 mm. across, subconical, the male portion glabrous; anthers easily falling, 2 mm. long, glabrate, ridged sides with hyaline pollen sacs except at the base and at the thick flat expanded apex, numerous; pistils few in the center, shorter than the stamens, densely yellowish hirsute

MISSOURI BOTANICAL
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except the bluntly pointed stigma. Fruit globose or obovoidly ellipsoid, glabrous, 1.5 to 2.5 cm. long, few to severally clustered upon stipes nearly as long.

Type specimen number 17775, *A. D. E. Elmer*, Los Baños (Mt. Maquiling), Province of Laguna, Luzon, June-July, 1917. Found scattered in dry or well drained forested slopes at middle elevation.

Distinguished from *Papualthia loheri Merr.* by its shorter leaves, blunter calyx teeth, longer petals and fruiting receptacle not at all enlarged; from *Papualthia flava Merr.* by its thinner narrower leaves and by the much larger united calyx. Dedicated to *C. F. Baker*, dean of the College of Agriculture at Los Baños.

Desmos elegans Elm. n. sp.

A little tree or shrub-like. Stem about 10 cm. thick, main branches numerously and laxly rebranched; twigs very slender, ferruginous hairy. Leaves numerous, alternate, scattered, oblongish or lanceolate, entire, acute to subacuminate, submembranous and subglabrous, obtuse or obtusely rounded at the base, upon 3 mm. long scurfy brown and sparsely hairy petioles, the larger ones 8 cm. long by 3 cm. wide, the apical ones usually smaller, curing dull brown but paler beneath; midrib prominent beneath, brown and somewhat strigose, with 5 to 7 ascending relatively obscure pairs of nerves; the minute apical buds or very young leaves hirsute. Infrutescence toward the top but lateral, upon 1.25 cm. long stout terete brown sparsely hairy stalks which are somewhat thickened toward the distal end and minutely few bracteate at or near the base; persistent calyx bluntly toothed; torus 5 mm. across, yellowish brown tomentose; carpels 3 to 5-clustered or even solitary, peanut-shaped, up to 2.5 cm. long, cylindric to obovoid or ovoid, bluntly pointed, constricted into a short stipe, green, curing brown, appressed strigose when young.

Type specimen number 17649, *A. D. E. Elmer*, Los Baños (Mt. Maquiling), Province of Laguna, Luzon, June-July, 1917. Discovered in dense forests at 1500 feet altitude.

Papualthia lanceolata (Vid.) Merr. but fruits with a short stout point, smaller, upon shorter stalks, cylindric or only with occasional constrictions.

AQUIFOLIACEAE

Ilex apoensis punctata Elm. n. var.

An Erect shrub or tree-like. Twigs numerous, gray, the tips glabrous and striate. Leaves copious, alternate, likewise glabrous, lucid and much darker green above, curing very unequally brown, short oblong to subelliptic, abruptly acute, entire, broadly obtuse at the base, rigidly coriaceous, upon petioles up to 1 cm. in length but usually somewhat smaller, largest ones 7 cm. long and 3 cm. wide, glandular punctate on the nether side; midrib prominent, with 5 to 7 rather faint and oblique nerves on each side, reticulations obscure. Infrutescence lateral or axillary, solitary or few clustered, racemosely spicate, glabrous, up to 2 cm. in length; fruits alternatingly scattered, upon 3 mm. long stout pedicels which at the base are subtended by minute persistent bracts, drupaceous, short ellipsoid and about as long as their pedicels, subtended by the persistent calyx, terminated by a raised stigma, wrinkled in the dry state, smooth; calyx united at the base, its 5 lobes ovate, glabrous or margins very finely ciliate; seeds straw brown, 3 to 5, achene-like.

Type specimen number 17624, *A. D. E. Elmer*, Los Baños (Mt. Maquiling), Province of Laguna, Luzon, June-July, 1917. Collected in alpine forests.

Between *Ilex pulogensis Merr.*, *Ilex hanceana Maxim.* and *Ilex apoensis Elm.* it seems to be nearest related to the last.

APOCYNACEAE

Parsonsia magnifolia Elm. n. sp.

A large or coarse rambling or climbing shrub. Twigs subterete, somewhat compressed at the attachment of the leaves, smooth, yellowish gray, with a large pith. Leaves glabrous, thickly coriaceous, upon 3 to 5 cm. long stout petioles which are usually twisted at the base, ovately rotund, entire, terminated by a short acute point, base broad and the larger ones shallowly cordate, obscurely puncticulate beneath, much darker green above, the larger blades 2 dm. long by 1.5 dm. wide; midrib prominent, with 4 to 6 pairs of ascendingly curved lateral nerves, the cross bars rather faint. Infrutescence suberect, axillary, 10 to 15 cm. long, the upper one half corymbosely few branched, all the branches thick, glabrous, similar to the twigs in color; fruiting calyx very thick and persistent from the distal ends of the branchlets, turbinate and upon a pseudostalk, at least 1 cm. long and nearly as broad across the 5-apiculate otherwise truncate apex. Fruit 16 cm. long by 1.5 cm. thick, subterete, blunt at the base, sharply pointed, rigid, glabrous, dull green but dirty brown when dry, longitudinally dehiscent and divided by a thin or membranous portion; seeds numerously packed in each half, the coma portion toward the distal end; achene imbricately overlapping, dull brown, nearly 2 cm. long, lanceolate, striate, somewhat compressed above the pointed base; coma silky, about twice as long, profuse and persistent, radially spreading, white except at the brownish base.

Type specimen number 17867, *A. D. E. Elmer*, Los Baños (Mt. Maquiling), Province of Laguna, Luzon, June-July, 1917. Gathered in dry jungled woods at low altitude among the grass covered hills.

Probably the same as *Parsonsia confusa Merr.* but our much larger leaves are ovate in shape rather than elliptic.

ARACEAE

Rhaphidophora lagunensis Elm. n. sp.

A small tree climber and forming tangled masses. Branchlets glabrous, terete, 1.25 cm. thick, prominently and rather closely ringed, succulent at the green tips, often with slender streamers. Leaves numerous, arranged in 2 alternating rows, crowded terminally, glabrous, thickly coriaceous, diverse in size, usually much smaller ones at the base of the same branch or upon the shoots or streamers; petiole much ascending, up to 6 cm. long, caniculate along the upper side, expanding and clasping at the base, rather stout, the edges of the canal often winged; blades up to 15 cm. long and nearly one half as wide below the middle, usually smaller, ovate, acute, broadly obtuse or rounded at the base, descending from the end of the petiole, lucid and much darker green above, folded, entire; midrib pronounced, the very fine and numerous lateral nerves ascending. Peduncle solitary or few, terminally clustered, 10 cm. long, thick, ascending, terete, glabrous; spikes erect, equalling the peduncles, terete, glaucous green, 2 cm. thick; spathe very thick, abruptly but sharply pointed at the apex, sides tightly overlapping, rigid and very thick, green on the outside, yellowish on the inner surface; drupes forming a solid cob, the flat apex stoutly rimed and sunken, the middle with a blunt stigmatic point, angular, 5 to 8 mm. long or longer; seeds several near the base, compressed, oblong or obovately so, liberated by the decay of the ovary into ciliated hairs.

Type specimen number 17812, *A. D. E. Elmer*, Los Baños (Mt. Maquiling), Province of Laguna, Luzon, June-July, 1917. Abundant in the jungles around the summit of the mountain.

Rhaphidophora perkinsae Engl. but our plant has more numerous and much smaller leaves whose thinner petioles are less than one half as long.

Rhaphidophora stenophylla Elm. n. sp.

A small climbing shrubby plant. Stem tough, terete, 1.5 cm. thick, few branched; twigs glabrous, ringed every 2.5 cm. Leaves alternate, well scattered; petiole up to 10 cm. long, expanded and clasping at the base, grooved along the upper side, rather slender and glabrous; blades subcoriaceous, linear to broadly lanceolate, the average blades 2.5 dm. long and 3.5 cm. wide, gradually tapering to the falcate sharply acuminate apex, entire, obtuse or rounded at the base, glabrous but the lower surface minutely yellowish gray punctate, much paler green beneath, when dry copper brown below and nearly black on the upper side; midrib quite conspicuous and very dark in the dry state, the relatively obscure nerves ascending and only slightly curved. Peduncle terete, 5 to 8 mm. thick, several cm. long, green, glabrous, terminal, usually solitary, ascending and ascendingly bent at the apical portion; spike slender, 10 cm. long, fully 1 cm. thick, its spathe early falling; drupes about 5 mm. long, flat and somewhat angular at the expanded top, terminated by a very short central stigmatic point, their contiguous sides finally breaking up into fine bristles; seeds obovoid, compressed, few to several, 2 mm. long, light brown near the base and surrounded by palea.

Type specimen number 18449, *A. D. E. Elmer*, Los Baños (Mt. Maquiling), Province of Laguna, Luzon, June-July, 1917. Along the lower edge of the forests.

Rhaphidophora acuminata Merr. but our leaves average only one half as wide and are subfalcate toward the much more acuminate apex.

Rhaphidophora trinervia Elm. n. sp.

A tree trunk climber. Stem toward 5 cm. thick, subterete, with climbing rootlets along the side near the tree. Leaves few, alternate, a meter long or longer, glabrous, coriaceous, upon a stout petiole, the lamina portion pinnately dissected; rachis very strong, rounded beneath, caniculate above; segments varying from 3 to 8 cm. wide, equally wide throughout, the middle or average ones 2 dm. long, paler beneath, apex obliquely truncate, the basal corner rounded, the upper corner extended into a falcate acuminate point, prominently 2 to 4 or even 5-veined, the lower surface minutely dotted, secondary veins parallel and much less conspicuous, more or less traversed by oblique lines. Spikes usually solitary, erect from the ascending stout stalk, terminal, 2 dm. long more or less, even and cylindric, about 2 cm. thick; drupes closely set, 7 mm. long, columnar, 4 mm. thick, the apical sunken portion quadrangular or pentagonal and with a raised thickened rim, stigma mammillate and located in the center; neck angular and composed of fibrous bundles; seed at least 1.5 mm. long, light brown, compressed, numerous, imbedded in the basal portion, oblong, attached to filamentous threads, dispersing by the bursting of the membranous ovary wall.

Type specimen number 18057, *A. D. E. Elmer*, Los Baños (Mt. Maquiling), Province of Laguna, Luzon, June-July, 1917. A forest tree climber along the humid creeks in the vicinity of the boiling mud-springs.

Allied to *Rhaphidophora grandifolia Krause*, but our shorter leaflets have usually three instead of two veins and are without tubercular thickenings.

ASCLEPIADACEAE

Heterostemma herbertii Elm. n. sp.

A suffrutescent vine, twining about small stems up to 8 m. high. Stem 1.25 cm. thick, subterete though with 2 longitudinal grooves on opposite sides, covered by yellowish gray bark, branched mainly toward the top, its soft woody tissue is pale white; branches glabrous, wiry, long, green, usually opposite. Leaves also opposite, entirely glabrous, easily becoming detached, ovate to ovately elliptic, horizontal or descending, flat and coriaceous, the basal or older blades 2 dm. long by 15 cm. wide, broadly rounded or shallowly cordate, obtuse but with a sharp apical point, upon 5 cm. long stout petioles which are usually twisted at the base, the top leaves much smaller and upon relatively short petioles, lighter green beneath, the conspicuous midrib with 5 to 7 lateral nerves on each side, reticulations coarse and quite evident, entire. Inflorescence ascending, axillary, glabrous, upon stout green somewhat compressed peduncles up to 2 cm. in length; pedicels crowded from the end of the common stalk, the longer one nearly equalling the peduncle, slender and also green, spreading, after falling leaving a thickend and roughened receptacle; flowers green in the immature state, orange red in anthesis, very flat and with 5 obscure points, appearing star and wheel shaped, up to 1.75 cm. across; sex organs small, central and basal, opening at the pentagonal apex. Pods usually in pairs from somewhat thickened pedicel ends, 10 cm. long, glabrous, green, gradually and sharply pointed, longitudinally dehiscent, subterete, 1 cm. thick, with a membranous dissepiment along the inner side of the suture; seeds many, imbricately placed with silky comma upwards, the achene portion 1.5 cm. long, curved and whitish brown margined especially about the rounded basal portion.

Type specimen numbers 17661 in flower and 18247 in fruit, *A. D. E. Elmer*, Los Baños (Mt. Maquiling), Province of Laguna, Luzon, June-July, 1917. Discovered in very damp forested flats at 1500 feet altitude.

This remarkably distinct *Asclepiadaceae* I take pleasure in naming after *Herbert F. Copeland* who accompanied me on my first trip to the summit of mount Maquiling.

Toxocarpus rubricaulus Elm. n. sp.

A sprawling and scandent climber. Branches subterete or quadrangular, glabrous, reddish brown when dry, long, tough or wiry. Leaves likewise glabrous, coriaceous, scattered, opposite, sublucid above, much paler green beneath, upon petioles 3 cm. in length, petioles usually curved at the base and leaving raised circular scars after falling, short oblong or ovately elliptic, short acute, base broadly obtuse or rounded, entire, the larger blades 10 cm. long by 5 cm. wide, midrib conspicuous beneath, the numerous divaricate nerves obscure. Cymose panicle up to 10 cm. long, divaricately rebranched from near the base, axillary, occasionally few fascicled; branches spreading, slender, subtended by minute bracts, finely but densely fulvous pubescent; flowers widely spreading, yellow, faintly fragrant; pedicels longer than the 5-toothed pubescent 2 mm. long calyx whose margins are frequently subhyaline; corolla whitish, glabrous, imbricate in the bud state; petals 5 mm. long, narrowly oblong, rotately spreading and twisted, united at the base; pistil spindle shaped, glabrous. Fruit in divaricate pairs, ridged, glabrous, dark green, terete, linear, gradually coming to a sharp point, 10 cm. long, longitudinally dehiscent; seeds 1.5

cm. long, glabrous, very flat and curved upon one side, linear, bearing at the apex a tuft of silky hairs.

Type specimen number 18297, *A. D. E. Elmer*, Los Baños (Mt. Maquiling), Province of Laguna, Luzon, June-July, 1917. Among jungles of the upper parang formation.

Its lax more pubescent inflorescence, slenderer petals and larger more coriaceous leaves serve to distinguish it from *Toxocarpus loheri Schltr.*

CAPPARIDACEAE

Capparis viridis Elm. n. sp.

A rambling subscandent shrub. Twigs rather slender, terete, the ultimate one greenish and glabrous, with scattered recurved solitary or pairs of spines along the lower side. Leaves alternate, well scattered, oblong, quite abruptly acute to subacuminate, base obtusely rounded, edges entire, upon 5 to 8 mm. long dark brown petioles, also glabrous, curing green, the lower surface lighter green, more or less punctate on both sides, the larger blades 12 cm. long by 4 cm. wide; midrid yellowish green, pronounced beneath, the 7 to 10 pairs of lateral nerves divaricate and relatively obscure, reticulations none; stipules developed into spines. Infrutescence terminal, corymbosely racemose or short paniculate, 15 cm. long and nearly as wide, few and short branched, green and glabrous; fruits upon 2.5 cm. long pedicels, constricted into 3.5 cm. long stipes which can only be distinguished from the pedicel proper by the annular vestige of the flower, globose, 2 cm. in diameter, rather hard and dull or yellowish green, crustaceous; seeds few, hard, 1 cm. long, dull brown and rugose, with compressed sides.

Type specimen number 18061, *A. D. E. Elmer*, Los Baños (Mt. Maquiling), Province of Laguna, Luzon, June-July, 1917. Gathered in dry jungles at low elevation.

Very near to *Capparis oblongata Merr.* from which it differs in its greener leaves which are less conspicuously nerved and more or less punctate on both sides, and especially by its corymbose not paniculate infrutescence.

COMPOSITAE

Vernonia acuminatissima Elm. n. sp.

A large forest tree. Twigs terete, when young brown puberulent, ultimately glabrous, rather slender. Leaves alternating, lanceolate, membranous, slenderly acuminate, obtuse at the base, entire, the paler nether side minutely punctate and when young pulverulent, finally glabrous, upon slender 1.5 cm. long glabrate petioles, diverse in size, the larger lamina 2 dm. long and 5 cm. wide across the middle but frequently much smaller especially those subtending the inflorescence. Panicle terminal, erect, freely and laxly rebranched, brown puberulent, the main alternating branches arising from near the base and subtended by reduced leaves, cymosely branched toward the top and subtended by correspondingly reduced foliaceous bracts, the ultimate branches and pedicles without subtending bracts; pedicels varying from 3 to 7 mm. long, minutely stellate brown puberulent, bracteate toward the distal end; calyx bluntly ellipsoid in the bud, turbinate when in anthesis, 4 mm. long and nearly as wide across the top; involucral bracts imbricate, narrowly or elliptically oblong, obtuse at both ends, gradually reduced toward the base, the upper outer ones 2.5 mm. in length and 1.25 mm. wide, ciliate on the edges and puberulent toward the apex on the exposed outer side, the inner glabrous ones linear and ciliate on the margins; flowers about 5, all discoid, erect; corolla tubular, bluish purple, glabrous, 5 mm. long, thickened or slightly inflated above the middle, with 5 setaceously recurved and twisted segments; stamens very linear, one half as long as the tube, almost entirely included, sharply pointed, basifixed, forming a tube about the style just below the slender recurved stigmatic arms; achenes somewhat compressed, tapering toward the base, 1 mm. long, obscurely ridged or striate, minutely ciliate; pappus profuse, as long as the corolla tube, whitish, equal in length, with a circle of minute bristles mixed in between them at the base, nearly smooth, straight and erect.

Type specimen number 18064. *A. D. E. Elmer*, Los Baños (Mt. Maquiling), Province of Laguna, Luzon, June-July, 1917. Gathered upon a very steep ridge near the mount Maquiling cliff rim above the bulala plantation.

Apparently most closely related to *Vernonia urdanetensis Elm.* from which it is distinguished by its glabrous leaves, longer pedicels and the more elongated involucral bracts which are ciliate along the edges and puberulent on the dorsal apical portion.

CONVOLVULACEAE

Erycibe copelandii Elm. n. sp.

A liana. Stem 1 to 2 dm. thick; main branches toward the top, freely rebranched and forming tangled masses, tough, terete, grayish brown, glabrous. Leaves alternating, ample, well scattered, also glabrous, rigidly coriaceous, oblong, rounded at both ends but apex terminated in a short acute point and base sometimes merely obtuse, lucid and darker green above, entire, drying equally brown on both sides, 4 to 6 cm. wide, 10 to 15 cm. long, upon a 1.25 cm. long caniculate rather stout petiole which after falling leaves a raised circular scar; midrib pronounced beneath, with 7 to 10 ascendingly curved and more or less interarching lateral pairs of nerves, reticulations coarse and obscure. Infrutescence terminal, varying from 1 dm. to 1 m. in length, paniculate although the main branches are short rebranched, rigid, yellowish gray, the ultimate ones appressed yellowish brown pubescent; pedicels alternate, not numerous, scattered, 1 cm. in length, stout and similar in vestiture, apparently articulate at the base and after falling leaving prominent scars, usually provided with 1 or 2 very blunt scattering bracts; calyx persistent, 5 to 8 mm. across, saucer shaped, the imbricate bracts rotund and somewhat united at the base, strigose except the inner surface, rigidly chartaceous; drupes fusiform, 2 to 3 cm. long, terete, with a stone-like endocarp and apparently 1-seeded, the shining exocarp fleshy and white.

Type specimen number 18001, *A. D. E. Elmer*, Los Baños (Mt. Maquiling), Province of Laguna, Luzon, June-July, 1917. Discovered in dense humid forests far above the bulala plantation.

Its much larger leaves serve to distinguish it from all other Philippine species of this genus. The numerous white fruits hanging in long streamers from the crown of tall trees presented an imposing sight. Dedicated to *E. B. Copeland*, original and for many years dean of the College of Agriculture, University of the Philippines.

CUNONIACEAE

Weinmannia luzoniensis puberula Elm. n. var.

A small sized tree. Branchlets lax, terete, soft pubescent especially the young portions. Leaves opposite, 12 to 20 cm. long, imparipinnate, 7 or 9-foliolate, petiole and rachis pubescent; leaflets oblong to obovately oblong, submembranous, much paler and nearly glabrous beneath, the terminal or larger one cuneate at the base, the others broadly obtuse, margins crenately serrate, the larger blades 10 cm. long by 3.5 cm. wide, acuminate; midrib pronounced beneath, sparsely strigose, with 7 to 10 pairs of divaricate nerves whose ends are reticulately united; interaxillary bracts 1 to 1.5 cm. broad and nearly as long, foliaceous, entire or obscurely crenate, sparsely pubescent on the outer side, constricted at the base, deciduous. Inflorescence terminally clustered or from the uppermost leaf axils, up to 1 dm. in length, severally spicate from 5 to 8 mm. long cinereous stout stalks; rachis slender, similarly pubescent; flowers whitish, usually in small clusters, well scattered throughout the whole length except the basal 1 cm. long pedunculate portion; pedicels slender, 2 mm. long, soft hairy, subtended by very small blunt bracts; calyx 0.5 mm. long, united toward the base, pubescent, acutely 4-toothed; petals nearly twice as long, oblong or subovate, glabrous, 0.75 mm. wide and 1 mm. long, roundly obtuse; stamens about 8, the slender free filaments glabrate and 2.5 mm. in length, inwardly curved in the early state; anther orbicular, 0.5 mm. across, its cells nearly divided from the apex toward the base or point of attachment; disk coriaceous, glabrous; pistillodes hirsute.

Type specimen number 18066, *A. D. E. Elmer*, Los Baños (Mt. Maquiling), Province of Laguna, Luzon, June-July, 1917. In the summit regional woods.

Apparently differs from typical *Weinmannia luzoniensis Vid.* by its less chartaceous leaves, more pubescent and longer filaments.

DILLENIACEAE

Dillenia reifferscheidia rosea Elm. n. var.

A sturdy erect tree. Trunk 6 dm. thick, short, with widely spreading limbs which are crookedly rebranched; twigs rigid, 1 cm. thick, somewhat hairy when young. Leaves alternatingly clustered toward the distal ends, chartaceous, elliptic or somewhat narrowed toward the base when young, coarsely and crenately toothed, apical acumen 1 cm. long, paler green beneath and sublucid on the upper surface, 2 by 3 dm. or much larger, entirely glabrous when old; petiole very stout, 2 to 3 cm. long, hairy in the early state and with deciduous obovately oblong adnate stipules which are hirsute, caniculate, enlarged at the base; midrib strong and ridged beneath, sparsely hairy along the sides, with at least 16 pairs of pinnate divaricate prominent nerves, the cross bars evident from both sides when dry. Flowers terminal, solitary or 2 or 3 from the same stalk, rose red; peduncle somewhat compressed, arising from between the broad stipular bracts, subtended by caducous lanceolate elongated bract lobes, 5 cm. long, stout, densely covered by tawny colored hairs, when in fruit nearly 8 cm. long and almost glabrous; buds globose, the outer segments sparsely pubescent toward the base; calyx lobes imbricate, coriaceous, pale green, formiug a cup 8 cm. across, the basal ones smaller and ovately orbicular, the larger ones more elongated, persistent, deeply concavo-convex especially the inner ones; stamens very numerous, pale white or yellowish tinged, divaricately spreading, the linear anthers with terminal pores; pistils of the same whitish color, rotately spreading over the stamens and about as long, pointed toward the ends; petals obovate, 6 to 8 cm. long by at least one half as wide, broadly rounded, more or less narrowed toward the base, rose red, horizontally spreading over the calyx. Carpels greenish, wavy, twisted and recurved, fleshy, with sour juice, tightly covered over by the thickened pale green hard calyx segments, thereby forming a subglobose fruit 5 to 8 cm. in diameter.

Type specimen number 18025. *A. D. E. Elmer*, Los Baños (Mt. Maquiling), Province of Laguna, Luzon, June-July, 1917.

Discovered only one tree of this red flowered variety on the steep densely wooded southern slope of the socalled crater. It was observed that all the flowers on this tree were pink or like those of *Nelumbium nelumbo (Linn.) Druel.* Other trees of the pure white flowered species of *Dillenia reifferscheidia Vid.* were common in the vicinity.

ELAEOCARPACEAE

Elaeocarpus maquilingensis Elm. n. sp.

A small suberect tree. Twigs numerous, lax, terete, grabrate, often in subwhorls. Leaves copious, also glabrous, alternate, crowded toward the ends, broadly lanceolate or ovately oblong, gradually tapering into caudate points, obtusely rounded at the base, upon very slender 2 to 3 cm. long glabrous petioles, with a glandularly thickened distal end, the larger blades 8 cm. long by 3.5 cm. wide, entire around the base and along the apical point, otherwise rugose and distantly apiculate, subcoriaceous, shining above, pale green beneath; midrib with about 5 obscure ascendingly curved lateral nerves on each side, reticulations minute and in the dry state more evident from the upper side. Infrutescence lateral, spreading, below the foliage, 3 to 7 cm. fruit long, sparingly branched, all the stalks glabrous and very dark green; fruit ovoidly globose, about as long as their pedicels in the dry wrinkled state, subtended by the yellowish brown rugose disk; seed stone-like, longitudinally rugulose.

Type specimen number 18039, *A. D. E. Elmer*, Los Baños (Mt. Maquiling), Province of Laguna, Luzon, June-July, 1917. Found on wood covered cliffs in the socalled crater.

Allied to *Elaeocarpus gitingensis Elm.* yet primarily distinguished from it by the different leaf cut, by the infrutescence being chiefly below the foliage and by the much longer fruiting pedicels.

EUPHORBIACEAE

Antidesma fusicarpum Elm. n. sp.

A suberect and laxly branched shrub up to 3 m. high. Twigs slender, the apical portion soft dull brown pubescent. Leaves alternate, rather few from the apical ends of the lateral branchlets, upon very slender similarly pubescent petioles up to 2 cm. in length; stipules 5 to 8 mm. long, very linear and usually curved, caducous, grayish tomentose, arising from the side of the branch; blades membranous, paler green and puberulent beneath, becoming glabrate above, oblong or ovately elongated, the smaller ones broadly lanceolate, 10 to 15 cm. long by 3 to 5 cm. wide, gradually tapering to the acuminate point, the apex very finely mucronate, base obtusely rounded or truncately so, entire; midvein quite conspicuous beneath and pubescent, the 5 to 7 pairs of lateral nerves oblique and somewhat curved, reticulations obscure. Infrutescence spicate, slender, usually curved, solitary from the ends of the leaf bearing short lateral branchlets as well as from the main branch itself, equalling the foliage; peduncle and rachis yellowish gray pubescent, with bract vestiges; pedicels divaricate or at right angles to the rachis, solitary or 2 or 3-clustered, 3 to 4 mm. long, slender, sprinkled with fine hairs, subtended by similar bract vestiges, subpersistent, terminated by the small minutely 5-toothed woolly and grayish white calyx; carpels fusiform when dry at least, 5 to 7 mm. long, subterete or slightly compressed, coarsely rugose, glabrate, terminated by a short terminal minutely hairy stigma, pale green to pink and short ellipsoid or globose in the fresh state, juicy and sour.

Type specimen number 18083, *A. D. E. Elmer*, Los Baños (Mt. Maquiling), Province of Laguna, Luzon. June-July, 1917. Collected in deeply shaded ravines along the main creek at about 1000 feet altitude.

Primarily distinguished from *Antidesma rostratum Tul.* by its long and slender petioles, and from *Antidesma subcordatum glabrifolium Merr.* by its differently shaped drupes.

Glochidion canescens Elm. n. sp.

A small tree or shrub like. Branches slender, lax, olivaceous soft pubescent, somewhat angularly compressed toward the tips. Leaves submembranous to subchartaceous, alternatingly scattered, ovately oblong or the basal smaller ones subelliptic, often a trifle falcate toward the abruptly acute to acuminate apex, base broadly rounded, subsessile or upon very short pubescent petioles, up to 12 cm. long, one third as wide, upper shining surface darker green and glabrous except the midrib, nether side canescent, midrib ridged beneath and hairy on the upper side also, 5 to 8 ascendingly curved rather conspicuous nerves on each side, cross bars or reticulations faint, when dry brownish beneath and gray above. Flowers fascicled in the leaf axils, the 3 to 5 mm. long and soft hairy pedicels subtended by minute bracts; calyx 3, thickly coriaceous, similarly pubescent, rotund, valvate, 1.75 mm. in length, covering the inner organs; petals as many, a trifle shorter, glabrous, also valvate and alternating with the calyx lobes, similar in shape; stamens 5, forming a short and thick or ellipsoid tube, sessile, thin, connectives very bluntly extended; pistil obsolete or represented by an appendage. Fruit upon short pubescent pedicels, compressed globose, 5 to 8 mm. across, canescent, sunken at the apex and with a short stout style, usually subtended by part or all of the calyx, 5 or 6-celled and with twice as many obscure ridges.

Type specimen Forestry Bureau number 25397, collected by *C. Mabesa*, Los Baños, Province of Laguna, Luzon, March, 1916. In brushland near the lakeshore. Number 5235, *F. C. Gates* in marsh land near Los Baños is apparently the same.

A close ally of *Glochidion molle Blm.* but our pubescence is shorter and denser, larger leaves are shining and glabrous on the upper side and whose bases are quite different.

FLACOURTIACEAE

Casearia zschokkei Elm. n. sp.

A tree up to 8 m. high and 3 dm. thick. Branches slender, yellowish brown to gray when dry and sprinkled with grayish white lenticels, glabrous. Leaves alternate. also glabrous, rigidly coriaceous, elliptic to elliptically oblong, smooth and similarly green on both sides, lucid above, broadly obtuse at the base, abruptly terminating into a short recurved bluntly acute tip, entire, upon 1 to 1.5 cm. long shallowly caniculate petiole, 6 to 9 cm. wide, 12 to 18 cm. long; midrib prominent on both sides and lighter colored, with about 5 ascendingly curved pairs of lateral nerves equally conspicuous on both surfaces, reticulations plain from both sides. Flowers densely fascicled in the leaf axils or in the axils of their scars, creamy white; buds ovoidly elliptic, the 5 to 7 mm. long glabrous and coriaceous pedicels subtended by minute grayish persistent and glabrous bracts whose apical margins only are finely ciliate; perianth segments 5, nearly equalling the pedicels in length, the outer 2 slightly wider, rotund, nearly free, faintly 3-veined, imbricate, the inner protected margins thinner and usually ciliate, concavo-convex; fertile stamens 7, alternating and forming a subconnate rim with the blunt and woolly covered staminodes, erect, from below the ovary; the glabrate filaments compressed, 3.5 mm. long, fleshy; anthers subbasifixed, elliptic, auriculate at the base, 1.25 mm. long, terminated by a blunt point; pistil free, equalling the stamens, sparsely ciliate; ovary conically elongated: style thick and short; stigma slightly larger than the style and flattened.

Type specimen number 555, *C. M. Mabesa*, Los Baños (Mt. Maquiling), Province of Laguna, Luzon, September, 1919. Discovered on a dry forested ridged at 1000 feet altitude.

Casearia trivalvis (Blco.) Merr. but our leaves are larger and shining green; flowers longer stalked, also larger and glabrous. Dedicated to *Theo. C. Zschokke*, in charge of the School of Forestry at Los Baños.

GESNERIACEAE

Cyrtandra maquilingensis Elm. n. sp.

A shrubby plant. Stem 5 cm. thick, 3 m. high, branched from near the base; branchlets curved, conspicuously marked by the leaf scars, obscurely angular and hairy toward the tips. Leaves opposite, the pairs often very unequal, the largest lamina 18 cm. long by 6 cm. wide, very sharply acuminate to setaceously pointed, base rounded or obtuse and somewhat oblique in the larger ones, oblong or the smaller ones broadly lanceolate, upon 1 to 3 cm. long caniculate petioles which in the younger state is covered with a deciduous olivaceous pubescence, very much paler green beneath even so in the dry state, glabrous on the upper surface and also on the lower side when old, entire around the base, otherwise obscurely dentate or spiculate; midrib prominent beneath, with 7 to 10 laterally oblique and slightly curved nerves on each side, all densely covered with yellowish brown hairs which are deciduous; bud bracts caducous, ciliate, lanceolate, 1.5 cm. long. Flowers few clustered from the leaf axils, upon short common stalks, subtended by an oblanceolate to linear more or less pubescent involucral bracts which are 3-veined and up to 2 cm. in length; pedicel hirsute, slender, 5 mm. long, subtended by smaller bracts; calyx greenish, 1.5 cm. long, turbinate, membranous and ciliate, the 2 broad lobes extended into a narrow projection which at the apex is 2 or 3-lobed; corolla 4 cm. long, the basal one third tubular, the upper two thirds inflated and 2 cm. wide across the broadly rounded short lobed apex, white, thin, with long appressed hairs on the exterior except toward the base and apex; fertile stamens 2, one half as long as the corolla, their filaments thread-like and curved; anthers oblong, nearly 4 mm. long; pistil about as long, the lanceolate hairy ovary extended into a thick similarly pubescent style; stigma thick, bilobed, papillate; disk glabrous, rigid, tubular, 1.5 mm. long and nearly as thick, truncate. Fruits 2 to 3 cm. long, terete, fusiform, densely covered with shining yellow hairs.

Type specimen number 17813, *A. D. E. Elmer*, Los Baños (Mt. Maquiling), Province of Laguna, Luzon, June-July, 1917. Discovered in the moss laden wooded ravines just below the peak.

Most closely allied to *Cyrtandra lagunae Krzl.* but our plant is pubescent, coarser, has much wider and more numerously nerved leaves.

GUTTIFERAE

Cratoxylon arboreum Elm. n. sp.

An erect forest tree. Stem 5 to 8 dm. thick, 20 m.

high, terete, crookedly branched and spreading toward the top; wood odorless and tasteless, moderately soft, reddish tinged toward the center; bark thick, castaneous or dull yellowish brown, longitudinally checked; branches many, glabrous, terete or a trifle flattened at the point of branching, brownish in the dry state, smooth, Leaves chartaceous, slightly lighter green beneath, opposite, also glabrous, curing unequally dull brown, sublucid on the upper side, 10 to 15 cm. long by 2.5 to 5.5 cm. wide, the upper or terminal ones usually smaller, acuminate, base obtuse, narrowly oblong to broadly lanceolate, entire, upon 5 to 10 mm. long nearly black petioles, the midrib ridged on the lower surface, with 8 to 12 obscure ascendingly curved lateral nerves on each side. Panicle wholly glabrous and with green branches, erect, terminal, up to 2 dm. long, about 15 cm. wide across the base, profusely branched, the basal branches subtended by small leaves, oppositely clustered from the main axis which is compressed at the point of attachment, the secondary branches likewise oppositely clustered; pedicels subumbellately fascicled, slender, 3 to 5 mm. long, often reddish tinged, globose, the opened flower atropurpureous; outer 3 to 5 perianth segments or calyx imbricate, 3 mm. long or longer, rigid, united below the middle, ovately oblong, broadly rounded at the apex; the 5 or more inner ones somewhat longer, submembranous, elliptic, nearly free, much overlapping, longitudinally veined from a common base, the lines or veins dotted; stamens indefinite, 4 mm. in length, densely clustered from the upper outer portion of the 3 succulent phlanges; the free filaments unequal in length, fleshy, pointed at the ends; anthers introrse, dorsifixed, oblong, truncately rounded at both ends. a trifle wider across the top, 0.50 to 0.75 mm. long; staminodes 3, alternating with the fertile groups; pistils large, bottle shaped, obscurely triangular, with a short neck and with 3 short stigmatic lobes. Capsule terete, 1 cm. long or less, glabrous, basal one half enclosed by the calyx.

Type specimen number 17724, *A. D. E. Elmer*, Los Baños (Mt. Maquiling), Province of Laguna, Luzon. June-July, 1917. Also number 15779, *Elmer*, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, April, 1916. In both places it was found in very humid forested flats or depressions at 2500 feet altitude.

In size and habitat it is distinct from *Cratoxylon celebicum Blm.* whose stamen clusters are less than one half as long and whose anthers are very much smaller than in our new species here proposed.

LABIATAE

Gomphostemma cinerea Em. n. sp.

Several stemmed suffrutescent plants 1 to 2 m. high. Stems angular, crooked, occasionally short branched, grayish brown tomentose. Leaves divaricate, opposite, few, mainly toward the top, oblong, the average lamina 2 dm. long by 8 cm. wide, membranous, glabrate on the upper much darker green side, the obtuse base entire, otherwise crenately toothed or merely apiculate, the acuminate point usually somewhat curved, stellately cinereous beneath especially along the midrib and larger nerves, upon 1 to 3 cm. long densely pubescent petioles; midrib pronounced beneath, with 5 to 8 ascendingly curved nerves on each side, reticulations conspicuous, all grayish white in the dry state. Inflorescence erect, fascicled from the axils of the leaves or their scars, 2 to 4 cm. across, stellate tomentose; flowers short pedicelled, subtended by unequally long bracts varying from linear to oblanceolate or even setaceous in shape; calyx longitudinally corrugate, at least 1 to 1.5 cm. long, gradually expanded from the base to the 5 subulate teeth; corolla 3 to 4 or 4.5 cm. long, minutely stellate on the exterior except the basal portion, pure white, the basal one half slenderly tubular, gradually becoming inflated toward the top, obscurely or broadly 3-lobed at the upper portion of the apex, the tip much extended into a broad laminate lobe which is usually notched at the apex; stamens 4 or 5, subequal, about as long as the corolla; filaments ribbon-like, the apical free portion with few tack-shaped hairs; anthers dorsifixed, oblong, 2 mm. long, the basal portion divided; style filiform, glabrous, free, equalling the stamens, ending in an unequally notched stigma; ovary ciliate at the top of the 4 lobes, otherwise glabrous.

Type specimen number 17836, *A. D. E. Elmer*, Los Baños (Mt. Maquiling), Province of Laguna, Luzon, June-July, 1917. Along stream beds of dense forests half way up the mountain.

Distinct from typical *Gomphostemma philippinarum Benth.* by its larger leaves which are much less pubescent and by the nearly twice as long corolla.

LEGUMINOSAE

Derris canescens Em. n. sp.

A scandent and sprawling shrub. Branches tough, terete, densely brown pubescent, the older ones numerously whitish lenticelled. Leaves alternate, scattered, up to 15 cm. long, oddly pinnate, more or less 21-foliolate from near the base, the rachis densely tawny pubescent; leaflets membranous, alternate or subopposite, short but distinctly petiolulate, elliptically oblong, broadly rounded at both ends, terminated in a minute hairy point, 3 cm. long by 1.25 cm. wide for the larger ones, paler and more hairy beneath, easily falling. Inflorescence lateral from the lower leaf axils or from below the foliage of the short lateral branchlets, paniculate, 3 to 5 cm. long, solitary and branched from near the base or sometimes 2 or 3-clustered, short pubescent; the ultimate branchlets short and mainly clustered toward the top, subtended by lanceolate hairy bracts of unequal lengths, the basal ones being the largest; pedicels 2 to 3 mm. in length, pubescent, terminated by a pair of similarly pubescent stipels; calyx 4 mm. long, nearly 3 mm. wide, thin or membranous, truncately rounded at the base, the broad upper segment notched, the 3 others equal, divided half way down to the base, rather acutely pointed; petals glabrous, whitish and finely sprinkled with purple, 6 mm. long; banner subelliptic, its basal one third clawed; keels and wings very similar, a trifle shorter, the basal one half slenderly clawed, the expanded portion oblong and toothed at the basal free side, apex broadly rounded; stamens 9, united except the apical one third free portion, glabrous, all bearing pale yellow basifixed anthers, the filaments gracefully curved from the middle; pistil glabrous, the ovary portion strap-like, narrowly winged along both sides and upon a long sparsely hairy stipe, the distal end with a short ascending style.

Type specimen number 17883, *A. D. E. Elmer*, Los Baños (Mt. Maquiling), Province of Laguna, Luzon, June-July, 1917. Discovered to be a large tree climber at the lower limit of the forests.

Probably as near to *Derris cumingii Benth.* as to any other, but our inflorescence is quite different and the very flat ovary is glabrous.

Spatholobus sanguineus Elm. n. sp.

A liana with 5 cm. thick stems. Branches long and sprawling, repeatedly branched, terete, densely olivaceous pubescent. Leaves widely scattering, alternate, upon 1 dm. long terete similarly pubescent petioles which are somewhat thickened at the base, 3-foliolate; leaflets subchartaceous, 15 cm. long by 8 cm. wide, the terminal subelliptic symmetric one upon a 3.5 cm. long petiolule, the lateral ovately subelliptic ones inequilateral and upon very short but thickened petiolules, all leaflets subtended by stipular appendages, base obtusely to truncately rounded, acute or short acuminate, upper surface glabrous when old, beneath much paler and ferruginous pubescent; midrib very prominent, with about 8 ascending and conspicuous lateral nerves on each side, the cross bars and reticulations quite evident. Inflorescence terminal or from the uppermost leaf axils, paniculately elongated, 3 to 5 dm. long, densely tawny tomentose, the relatively short ultimate branches divaricately arranged; flowers rather evenly scattered and alternate, the olivaceous pubescent rachis a trifle raised at the point of attachment; pedicel 1.25 mm. long, becoming easily detached; calyx deeply campanulate, similar in vestiture, 4 mm. long, divided half way down, the upper pair of segments connate, the 3 others subequal, all obtuse or the basal one acute, subtended by a fine pair of hairy appendages; petals glabrous, blood red or deep purple; banner 5 mm. long, the expanded portion nearly as broad, rotund, the base subsagittate and narrowly clawed; keels a trifle shorter, fully one half slenderly clawed, the lamina portion obliquely oblong and hastate on one side at the base; wings somewhat shorter than the keels, similarly clawed, the expanded portion pointed on one side of the base; stamens 10, in 2 unequal alternating series, 4 mm. long, united below the middle, the free portion expanded, glabrous; anthers orbicular, 0.25 mm. long; pistil pubescent, nearly straight, equalling the stamens. Fruit 5 cm. long by 1.5 cm. wide below the middle or widest portion, membranous, soft pubescent especially at the 1-seeded end, brown, the back suture nearly straight; seed very flat, oblong.

Type specimen numbers 17560 in flower and 18250 in fruit, *A. D. E. Elmer*, Los Banos (Mt. Maquiling), Province of Laguna, Luzon, June-July, 1917. Abundant in the lower forested belt.

Near *Spatholobus gyrocarpus* (*Wall.*) *Benth.* but our mature fruits are only one half as large.

LORANTHACEAE

Viscum loranthi Elm. n. sp.

Parasitic upon parasites. Host more or less swollen at the point of attachment. excavated and apparently in a semi-rotten state and is inhabited by small black ants. Stems in scattered clusters, up to 15 cm. in length, usually branched from near the base, divaricately spreading, flexible, terete, yellowish green, subligneous only at the very base, otherwise herbaceous, usually a trifle thinner at the basal ends; branches at right angles, nodulose every 5 to 15 mm., all the nodes 5 mm. thick more or less; the internodes longest at the base, expanded at the articulated ends, glabrous but apparently somewhat velvety, smooth, striately ridged when dry, the young apical points tapering and lighter green, breaking up at the joints. Flowers in dense fascicles or interrupted circles from around the distal end of each internode, very pale or yellowish green, sessile, coriaceous, glabrous, subtended by a leathery cupular bract; ovary ellipsoid, concentrically rugose, very thick, covered with minute glistening papillae, terminated by 4 short acute smooth lobes; stigma darker green, subcapitate, in the throat of the lobes, smooth and shining. Fruit subglobose, 3 mm. in diameter, soft, whitish and papillosely glistening, the persistent lobes usually yellowish green; seed solitary in each fruit, imbedded in a white slightly viscous meat, tick-like, shining green.

Type specimen number 17777, *A. D. E. Elmer*, Los Baños (Mt. Maquiling), Province of Laguna, Luzon, June-July, 1917. Upon *Loranthus estipitatus Stapf* of the parang formation.

This double parasitism on different members of the same family has been observed in various islands, and although it has a wide range and infests different species of *Loranthus*, it is more common in our immediate vicinity than in any other locality.

MELASTOMATACEAE

Melastoma holmani Elm. n. sp.

A suberect shrub 1 to 2 m. high. Branchlets crooked, rather lax, grayish white scale covered especially along the somewhat compressed young tips. Leaves submembranous, opposite, quite variably in size, upon 1 to 2 cm. long petioles whose upper side is covered with brown setose scales or bristles and gray scaly otherwise, ovately oblong to subelliptic, broadly rounded at the base, sharply acute to acuminate, 3 to 5-veined from the base, pale green and with numerous oblique cross bars, the larger blades 8 cm. long by nearly one half as wide at or below the middle, the upper surface conspicuously marked by linear yellowish white cystoliths, below setose especially along the veins and bars, margins entire. Inflorescence terminal, shorter than the foliage, often subtended by bract-like leaves; peduncle solitary or 2 or 3-clustered, short, provided with ciliately fringed scales, usually bearing few flowers from the middle or above it; pedicels subtended by 5 mm. wide and up to 1 cm. long oblong caducous bracts whose margins and median dorsal line are ciliate, covered with sharply pointed and ciliate margined gray scales; calyx ovoid, 1 cm. long, nearly as thick in the fruiting state, densely light yellowish gray scale covered; its lobes erect, deciduous, in 2 alternating series; the larger ones oblong, 5 to 6 mm. long, 4 mm. wide from the base, the apex very short acute to obtusely rounded, glabrous except along the median dorsal line and ciliate margins; those of the outer series alternating, shorter, setaceous and entirely scale covered; petals 5, strongly imbricate and somewhat twisted in the bud, pink to purple, unequal in shape, about 2.5 cm. long, narrowed toward the base, broad across the top, obovate or obovately oblong; stamens in 2 series, the 4 fertile ones about 3 cm. long, the 5 sterile ones only one third as long; filaments of the former terete, fleshy, 1 cm. long; fertile anthers curved, 2 cm. long, basifixed at the bilobed base, the terminal thickened portion with pollen; style on the upper side of the flowers, similar to the filaments; the flattened circular stigma small. Fruit irregularly splitting open; seeds numerous, brown, triquetrous, 0.5 to 0.75 mm. across.

Type specimen number 18479, *A. D. E. Elmer*, Los Baños (Mt. Maquiling), Province of Laguna, Luzon, June-July, 1917. Rare among the summit shrubberies of the mountain. Number 36 *Holman*, April, 1911, from the same altitudinal region is the same species.

Separated from the common low country *Melastoma polyanthum Blm.* by its broadly oblong and blunt nearly glabrous calyx segments. Dedicated to *R. M. Holman*, one of the original faculty members of the College of Agriculture and who first collected it.

Astronia merrillii Elm. n. sp.

A small ascending tree. Branchlets subangular, castaneous puberulent. Leaves opposite, chartaceous, entire, elliptic or elliptically oblong, few, broadly obtuse at both ends but the apex terminated by a short very sharply pointed usually curved tip, green and glabrous on the upper flat surface, glaucous beneath and the veins and cross bars covered with dark brown scales, upon 1 to 3 cm. long castaneous lepidote petioles, the average laminae 14 cm. long by 7 cm. wide across the middle; veins 5, prominent, the basal pair somewhat finer and running 3 to 5 mm. below the margin, the upper pair arising 8 mm. from above the base and running through the middle of each half, all terminating into the apex, cross bars numerous, conspicuous, all series at right angles. Infrutescence terminal, usually subtended by a leaf on one side and a shoot on the other, less than one half as long as the leaves, very dark brown or castaneous scurfy, corymbosely paniculate, up to 10 cm. long by nearly as broad across the top, frequently with 3 peduncles; secondary branches numerous above the middle, short; pedicels 3 mm. in length, few to several clustered; fruits 3.5 mm. thick, ovoidly globose, apiculately 5-toothed, dark brown lepidote especially around the top, becoming lacerated into persistent shreds.

Type specimen number 18430, *A. D. E. Elmer*, Los Baños (Mt. Maquiling), Province of Laguna, Luzon, June-July, 1917. Discovered in the very damp depression between the first and second summit peaks

Most closely related to *Astronia piperi Merr.* yet very distinct. The shape of its leaves suggest certain forms of *Astrocalyx*. Dedicated to *E. D. Merrill*, acting director. Bureau of Science.

Astronia foxworthyi Elm. n. sp.

A good sized tree. Trunk 5 dm. thick. buttressed at the base; twigs rather slender, terete. young portion glabrous. Leaves opposite, terminally clustered, conduplicate and with recurved tips, oblong or the smaller ones broadly lanceolate, obtuse at the base. gradually acuminate, much paler green beneath or subglaucous below when young, glabrous, upon slender 1 to 3 cm. long petioles which are brown scurfy when young. 4 cm. wide and 12 cm. long without the petioles. 3 veined from near the base, the lateral pair running at least 5 mm. below the margin, the faint cross bars not numerous and slightly ascending. Panicle terminal, erect, equalling the foliage, very finely yellowish brown lepidote, numerously and oppositely branched from below the middle, the ultimate ones very short; flowers yellow, commonly 3-clustered, the 2 mm. long brown pedicels subtended by bract vestiges; calyx 2.5 mm. long, subcampanulate, when dry rugose or longitudinally ridged, leathery, tawny puberulent or felty, obscurely 5-toothed; petals 5, folded into a hood, 1.25 mm. long, ovately rounded, very thin, fugacious, pale yellow, ultimately free; stamens about as many, the large anther upon short and thick filaments; style terete, strict, light colored, 1.5 mm. long, terminated by a large depressed capitate nearly black stigma.

Type specimen number 17964, *A. D. E. Elmer*, Los Baños (Mt. Maquiling), Province of Laguna, Luzon, June-July, 1917. Collected in a very damp forested flat at middle elevation.

Critically close to *Astronia viridifolia Elm.* whose inflorescence is less branched and whose petals are red. Dedicated to *F. W. Foxworthy* who is now in the British forest service at Kuala Lampur.

Astronia maquilingensis Elm. n. sp.

A small tree or tree-like shrub. Stem 3 dm. thick with a much branched crown; branches grayish white, lax, glabrous, numerous. Leaves opposite, mostly toward the top, coriaceous, glaucous green and when dry ashy brown beneath, dark green above, entire, subelliptically oblong or the smallest ones broadly lanceolate, upon 5 mm. long caniculate glabrous petioles, the larger ones 10 cm. long by one third as wide across the middle, 3-nerved from near the base and with a faint line just below the leaf margin, cross bars fine yet quite evident from below, acuminate to subcaudate, obtuse at the base. Inflorescence terminal, erect, exceeding the foliage, oppositely or subverticellately branched from near the base, all the branches more or less subglaucous and provided with minute and brown scales; flowers dull yellow, small, numerous, terminally fascicled, upon short but thick scurfy brown pedicels which are subtended by mere bract vestiges; calyx cupular, also covered by minute brown scales, 5.5 mm. long and about as wide across the truncate or minutely 5-toothed rim, somewhat narrowed toward the base; petals yellow, thin, almost rotund, very early falling or being pushed off by the pistil and stamens, 1.25 mm. across, as many as there are calyx teeth; stamens 5, barely exserted, their flattened filaments less than 1 mm. in length; anther subversatile, short ellipsoid, nearly as long as the filament; style erect, terete, fleshy, 2 mm. long, terminated by an enlarged much flattened and entire stigma; the sunken ovary radially striate at the top. Fruit subglobose, constricted just below the calyx rim, 3.5 mm. through; seeds linear, 1.25 mm. long, light brown, usually somewhat curved or subfalcate.

Type specimen number 17533, *A. D. E. Elmer*, Los Baños (Mt. Maquiling), Province of Laguna, Luzon, June-July, 1917. In the jungled woods near the summit of the mountain whose name it bears.

Typical *Astronia cumingiana Vid.* has larger leaves, longer petioles and are yellowish brown not ashy gray beneath.

MELIACEAE

Dysoxylum testaceus Elm. n. sp.

A small erect tree. Trunk 1.5 dm. thick, covered with minutely checked bark; twigs 1.5 cm. thick, appressed hairy or glabrate. Leaves alternate, crowded terminally, 3 to 5 dm. long, 15 to 21-foliolate, odd pinnate, submembranous, curing yellowish green especially so on the paler nether side; petiole about 1 dm. long, strict, terete, enlarged at the base, dirty yellowish brown puberulent as well as the rachis; leaflets sparsely pubescent beneath, upon 5 to 8 mm. long petiolules, oblong, the terminal ones obovately oblong, the basal much reduced ones ovate, abruptly acute, obtusely rounded at the very oblique base, the average ones 5 cm. wide and 12 cm. long; midrib pronounced beneath, with 10 pinnate pairs of lateral nerves whose faint ends are interarching, reticulations obscure. Infrutescence along the branches, usually in small clusters; stalks 1 to 3 cm. in length or longer, mostly unbranched, nearly glabrous when old; fruits sessile, alternate, 3 cm. long, obscurely angular and ovoid, tapering toward the apex and with a blunt base, smooth and brown or testaceous; seeds 3 to 5, planoconvex, nearly 2 cm. long and 8 mm. wide, oblong, rounded at the base, bluntly pointed at the apex.

Type specimen number 17386, *A. D. E. Elmer*, Los Baños (Mt. Maquiling), Province of Laguna, Luzon, June-July, 1917. Collected in the lower dry forested region, either along stream beds or upon ridges.

Primarily separated from *Dysoxylum cumingianum (Turcz.) DC.* by its larger, distinctly tapering, somewhat rugosely angular and non-lenticelled fruits.

MORACEAE

Ficus maquilingensis Elm. n. sp.

A rather small though erect tree. Stem 2 to 3 dm. thick, with relatively short branches; twigs quite slender, finely striate and when young yellowish brown pubescent. Leaves not numerous, coriaceous, alternate, scattered, subpandurate, the basal ones usually much reduced, entire or obscurely undulate toward the apex, glabrate, paler beneath but with minute white dots, abruptly short acute, faintly and auriculately rounded at the slightly inequilateral base, the larger lamina 2 dm. long by nearly one half as wide above the middle, upon stout hairy petioles reaching 4 cm. in length; midrib ridged beneath, usually strigose especially toward the base, with about 7 ascendingly curved nerves on each side and whose ends are archingly united, the 2 basal pairs not so prominent, cross bars quite evident, the larger nerves sprinkled with hairs; bud bracts and interaxillary stipules 2 cm. long, tapering from the base to the acuminate point, olivaceous pubescent along the median dorsal side, deciduous. Receptacles upon cauline tubercles, 2.5 cm. thick, obovoidly globose, smooth, purplish tinged on the exposed side, upon slender and glabrous peduncles equalling the fruits, usually subtended by a solitary blunt bract; umbilicus very slightly raised by the rugose thick bracts; tubercles up to 15 cm. long, quite rigid, clustered and branched, conspicuously roughened, ultimately glabrous; the inner umbilical scales ovately oblong near the orifice, lanceolate further down, membranous except the thick midvein, densely crowded; staminate flowers young, few, scattered among the inner umbilical scales, clavate, monandrous, with a 2 or 3-lobulate perianth, subtended by an oblanceolate bract twice their length; other flowers pistillate, numerous, some with short pedicels and long styles, others with long pedicels and short styles, glabrous, dark reddish brown when dry; stipes much thicker than the styles, at the base usually curved and somewhat adnate to the syconium, thickened toward the top; ovary portion very irregular in shape, angularly compressed; style sublateral, those of the older ones twisted, those of the younger ones straight; stigmas subclavate, all more or less united.

Type specimen number 17854. *A. D. E. Elmer*, Los Baños (Mt. Maquiling), Province of Laguna, Luzon, June-July, 1917. Along the main trail two thirds way up the mountain near the cliff at the spring.

Sufficiently distinct from *Ficus cuernosensis Elm.* by its longer peduncles and petioles, larger and differently colored receptacles, much broader leaves and more pubescent twigs.

MYRTACEAE

Eugenia silvestrei Elm. n. sp.

A large tree. Branches terete, ashy gray and very smooth, young portion entirely glabrous, the ultimate ones 5 mm. thick. Leaves opposite, well scattered, rigidly coriaceous, likewise glabrous, obovately oblong, rounded at the apex, subcuneate toward the base, much paler green beneath, shining on the upper side, upon stout 1.5 to 2 cm. long caniculate petioles which are not expanded at the base, 12 cm. long including the petioles, 5 cm. wide above the middle; midrib ridged beneath, with numerous obscure divaricate parallel nerves on each side, their ends forming a faint submarginal vein. Inflorescence terminal, corymbosely paniculate, 1 dm. long and about as wide; branches smooth, subterete or the ultimate ones much shorter and somewhat compressed, articulate and leaving gray scars after falling. Young flowers glabrous, appearing punctate, 3 to 5 terminally clustered, upon 5 mm. long subcompressed pedicels; calyx leathery, turbinate, 6 to 7 mm. long, 5 mm. wide across the truncate apex, subtended by a pair of stout bracts; petals whitish, calyptrate, glandular punctate. Fruits hard or subcoriaceous, terminally clustered, erect, 1 to 1.33 cm. long, 5 to 8 mm. thick, ellipsoid, terminated by the dark purple calyx rim, subtended by a pair of equal blunt bracts; pedicels 5 mm. long, upon 1 to 3 short internodal portions, all subtended by similar pairs of subpersistent bracts; seeds ellipsoid, stone-like, becoming separated into 2 unequal plano-convex portions.

Type specimen number 18011, *A. D. E. Elmer*, Los Baños (Mt. Maquiling), Province of Laguna, Luzon, June-July, 1917. In the lower forested belt. Here I refer also number 934, *C. F. Baker*, same locality, April, 1913.

A critical segregate from *Eugenia densinervia Merr.* and *Eugenia sablanense Elm.* Named after *Silvestre Dumo*, a faithful Ilocano boy.

Eugenia subsulcata Elm. n. sp.

A small burly tree. Branches crooked, rigid, terete.

gray except the glabrous brown tips. Leaves subchartaceous, opposite, subelliptic or oblongish, 10 to 15 cm. long by 4 to 6 cm. wide, comparatively grayish brown beneath when dry, abruptly short acute, broadly obtuse at the base, upon caniculate nearly black petioles less than 1 cm. in length, glabrous, sublucid and deeper green on the upper side; midrib rather prominent beneath, with 5 to 7 ascending nerves on each side and whose tips are much curved, reticulations evident from both sides. Flowers subsessile, glabrous, in small lateral clusters; calyx very short stipulate, thick, the flat cup shaped portion 5 to 8 mm. across; the 4 lobes well separated, thinner, 4 mm. wide, a trifle less in length, very broadly rounded; petals slightly longer and alternating with the calyx segments, about as wide, whitish and pellucid glandular. very short clawed; stamens numerous, inserted on the calyx rim, the outer or longer ones 7.5 mm. in length, free; anthers minute; ovary disk flat and glabrous; style terete, fleshy, curved, somewhat longer than the stamens. Fruit usually few clustered upon short gray thick woody stalks, short ellipsoid or subglobose, 2.5 cm. thick, occasionally a trifle oblique, terminated by a calyx rim, longitudinally striate or subsulcate, green and hard.

Type specimen number 18069, *A. D. E. Elmer*, Los Baños (Mt. Maquiling), Province of Laguna, Luzon, June-July, 1917. In woods or along the edge of the lower forests.

Closely related to *Eugenia rubrovenia C. B. Rob.* and to *Eugenia agusanensis Elm.*, both of which have much smaller flowers and whose leaves have conspicuous submarginal veins.

Eugenia maquilingensis Elm. n. sp.

A small but stocky tree. Branches numerous, terete, the smooth twig portion turning deep brown while drying. Leaves copious. conduplicate, opposite, scattered, rigidly coriaceous, shining and much deeper green on the upper surface, brown beneath and nearly black above on the dry specimens, glabrous, subelliptic to oblong. up to 10 cm. long by 4 cm. wide across the middle. abruptly caudate, base broadly obtuse to obtusely rounded, upon 5 to 8 mm. long petioles; midrib dark brown, conspicuous. the 8 to 12 lateral nerves on each side form a submarginal vein 3 mm. below the leaf edge, reticulations evident. Inflorescence terminal, usually shorter than the leaves, riged, glabrous, usually with

3 peduncles, few corymbosely branched, the ultimate ones somewhat compressed, all articulate at the point of branching but without bracts; flowers white, usually sessile and terminally clustered; calyx thick, turbinate, 4 mm. long and almost as wide across the truncate or very obscurely toothed apex, ebracteolate; corolla arising from the calyx, white, caducous, imbricately folded over one another, forming a rounded cone, falling together; stamens indefinite, incurved in the bud state, finally much spreading, inserted upon the calyx rim; the filaments subequal, up to 5 mm. long, turning reddish brown; anthers oblong, 0.33 mm. in length; style thick, shorter than the stamens, arising from the center of the deep concavity, terminated by a pointed stigma.

Type specimen number 17882, *A. D. E. Elmer*, Los Baños (Mt. Maquiling), Province of Laguna, Luzon, June-July, 1917. Gathered among the densely wooded summit region of the mountain after which it is named.

Critically related to *Eugenia alvarezii C. B. Rob.*, *Eugenia roseomarginata* of the same author and to *Eugenia benthamii Gray*, from all of which it is distinguished by its caudate leaf tips and by the double submarginal veins.

PANDANACEAE

Freycinetia robusta Elm. n. sp.

A rank low climber. Stem 8 cm. thick, terete, yellowish gray, obscurely ringed and spinulose; branches forming tangled masses, curved, stout, rigid, the ultimate ones ascendingly curved toward the leafy tips. Leaves imbricately crowded in 3 spiral series, leathery, paler green beneath, 7 cm. wide throughout and 7 dm. long, gradually tapering to the acuminately notched apex, edges nearly smooth or toward both ends finely serrate, midrib somewhat keeled beneath and smooth, lateral veins fine and very numerous; stipules adnate, 9 to 13 cm. long and up to 2 cm. wide, the blunt obtuse apical portion spinulose along the margin, submembranous toward the reddish brown sides, more coarsely veined than the blade itself. Infrutescence erect, terminal, upon a short common peduncle; secondary peduncles nearly 4 cm. long, brownish but glabrous, 1.25 cm. thick, ascending; spikes 3, ascending from the base, recurved toward the apex, hard, green or immature, subterete, more or less rugose, fully 5 cm. thick and 2 dm. long; drupes closely set, 1.5 cm. long, apical portion flat and thickened, the short neck more or less angular; seeds very numerous, stramineous brown, linear, 1.25 mm. in length, with a hyaline crest along 1 side, slightly curved, darker brown pointed at the ends, dehiscing through the shredded submembranous grayish white walls of the ovary.

Type specimen number 18026, *A. D. E. Elmer*, Los Baños (Mt. Maquiling), Province of Laguna, Luzon, June-July, 1917. Collected along the creek bottom of the so-called crater.

A very coarse plant whose leaves are smoother and whose spikes are twice as large than in *Freycinetia rigida Elm.*

Freycinetia subflagellata Elm. n. sp.

A large tree climber. Branches rather long, hanging and curved, 2.5 cm. thick, ascending toward the leaf bearing end. Leaves numerous, densely crowded, gracefully recurved, the reduced subflorescent ones dull red at or toward the base, 2.5 cm. wide, 7 dm. in length, very slenderly tapering into the subflagellate point, sharply serrate toward the base and minutely so toward the top, basal portion strongly conduplicate, margins of the point conspicuously involute, curing equally brown on both sides; midvein keeled and finely serrate along the slender tip and grooved along the upper side of the blade; stipule up to 5 cm. long by 5 to 8 mm. wide, chartaceous, adnate the whole length and entire. Infrutescence terminal, upon a short common stalk; secondary stalks or peduncles yellowish, 5 cm. long, rather slender, pulverulent and longitudinally edged with closely set serratures; head 3 to 5-clustered, 15 cm. long, 4 cm. thick, outwardly curved toward the top, nearly terete; drupes 1.25 cm. long, the contiguous angular sides yellowish, prominently constricted toward the apex in the dry state; the apex conically angled, red when fully mature, terminated by a flat more or less circular stigmatic portion and on which are seated normally 5 stigmas; seeds very numerous, 1 mm. long, linear, subfalcate, brown especially at the ends, disseminating through the lacerated basal portion of the ovary.

Type specimen number 17967, *A. D. E. Elmer*, Los Baños (Mt. Maquiling), Province of Laguna, Luzon, June-July, 1917. Collected in the vicinity of the coffee plantation.

Leaves narrower and the apical portion of drupes quite different from *Freycinetia banahaensis Elm.* which has yellowish not wine red inflorescent leaf bases.

RUBIACEAE

Plectronia mabesae Elm. n. sp.

An undershrub, 1 m. high. Stems and branches rigid and gray; the twigs brown and when young somewhat pubescent, usually opposite, sometimes ternate. Leaves deciduous, membranous, opposite or in pairs from the end of short branchlets, upon 5 cm. long more or less pubescent petioles, ovately oblong to subelliptic, the smaller ones broadly lanceolate, entire, membranous, paler beneath, the larger ones 8 cm. long by 3.5 cm. wide below the middle, acuminate, base obtusely rounded or broadly cuneate, glabrate, usually with interaxillary setaceously pointed short bracts, the very young twigs subtended by similar bracts, midrib evident and usually puberulent beneath, the 5 pairs of ascendingly curved nerves very fine. Flowers solitary or few clustered, axillary or terminal, upon very short finely hairy stalks which are subtended by short setaceous subpersistent bracteoles whose bases are very broad and somewhat connate, usually appearing with the young leaves, white, 3 cm. in length; calyx puberulent, 3 mm. long, broadly tubular, constricted below the 5-apiculate truncate rim; corolla glabrous, slenderly tubular, deeply 5-lobed at the top; segments oblong or ligulate, rotately spreading, 1 to 1.5 cm. long, obtuse at the apex; stamens 5, sessile upon the corolla tube just below the throat, glabrous; anthers linear, included, dorsally attached, 3 mm. long; style 6 mm. long, glabrous, the apical deeply cleft portion pulverulent; ovary completely imbedded. Fruit greenish and dry, when old turning brownish, obovoidly globose ultimately glabrous, didymous, 7.5 mm. long, terminated by the calyx vestige which is usually a trifle ciliate, 2-celled and as many seeded, the exocarp and especially the cell partition thin.

Type specimen in flower number 17427, *A. D. E. Elmer*, Montalban, Province of Rizal, Luzon, March, 1916; in fruit number 294, *C. Mabesa* (Forestry Bureau 26175), Los Baños, Province of Laguna, Luzon, August, 1916. The following numbers are referred to this species with certainty:—Bataan province, Luzon, Forestry Bureau numbers 3036, 6631 and 1263 *Whitford;* Ilocos Norte province, Bureau of Science number 32840; Benguet province, 6405 ***Elmer:*** and Antique province, Panay, 5886 and 5946 ***McGregor.***

Always found at low elevation and in stony ground along water courses. Named after *C. Mabesa* who first discovered it in fruit.

Neonauclea kobbei Elm. n. sp.

A small tree. Branchlets many, relatively short and forming dense masses, grayish, somewhat flattened at the point of branching, glabrous; bud bracts 1.5 cm. long, spathulate. Leaves opposite, also glabrous, shining and deeper green on the upper surface, oblong, bluntly obtuse, obtusely rounded at the base, upon 8 to 12 mm. long caniculate petioles, 4 by 10 cm. or smaller, curing equally brown on both sides; the conspicuous midrib with 5 to 7 slightly ascendingly curved lateral nerves on each side, reticulations obscure. Inflorescence terminal, leaf subtended, about 3 cm. long, with a short peduncle bearing 2 or sometimes 3 pedicellate heads, or as usual with only 3 pedicels, the 5 to 8 mm. long peduncle and 2 cm. long pedicels compressed and in the young state appearing strigose; flowering heads pale white, globose, 2 cm. in diameter; calyx 2 mm. long, minutely 5-toothed across the apex, gradually narrowed toward the base, densely gray tomentose; corolla glabrous, 5 mm. long, tubular but gradually enlarged from the base toward the apex, easily becoming dettached; segments 5, ovately rounded, 1.5 mm. long; stamens as many and alternating with the corolla lobes, inserted just below the throat; anthers upon very short filaments, oblong, 1 mm. in length; style persistent, almost twice as long as the corolla, fleshy and especially thickened toward the top, terminated by a large ovately globose stigma.

Type specimen collected by *F. Calycosa*, Los Baños (Mt. Maquiling), Province of Laguna, Luzon, Auguste, 1914. Here is also referred number 17 *Wm. H. Kobb* (Bureau of Forestry 6071), Gumaca, Tayabas province, Luzon, December, 1906.

Its few branched inflorescence and its densely pubescent calyx distinguish it from *Neonauclea barnardoi Merr.* From *Neonauclea calycina (Bartl.) Merr.* it is separated by its smaller heads upon shorter stalks and smaller bluntly pointed leaves. Dedicated to *Wm. H. Kobbe*, a former forester of the Bureau of Forestry.

SAPINDACEAE

Pegia philippinensis Elm. n. sp.

A liana like shrub. Stem terete though crooked, 8 cm. thick, with few but long and subpendant branches toward the top, slenderly rebranched; twigs terete, thickened and roughened at the leaf bearing ends, glabrous; wood soft, odorless and without taste, yellowish tinged; bark grayish brown, smooth or minutely checked, reddish beneath the epidermis. Leaves imparipinnate, 2 dm. long or shorter, with 5 to 9 leaflets; the leaflets glabrous, subcoriaceous, much paler green beneath, the smaller or basal ones ovate, the larger or upper ones subelliptic to oblong, blades 4 by 10 cm., opposite or subopposite, abruptly and sharply acute to acuminate, rounded at the subsessile base, the terminal one stalked; the petiole proper up to 5 cm. long, more or less thickened at the base and with short thick interaxillary subpersistent bracts; midrib quite evident but the 5 to 7 ascendingly curved lateral pairs of nerves faint, reticulations also evident. Panicle terminal or from the upper leaf axils, 10 cm. long, divaricately rebranched; pedicels glabrous, 2.5 mm. long, subtended by acuminate bracts less than 1 mm. in length; buds obovoid; calyx minute, the 5 sharp sparsely ciliate points united below the middle and forming a disk; petals 5 or 6, likewise glabrous, reflexed in anthesis, ligulate, 3 by 1 mm.; stamens about 10, erect, free but inserted upon a short rim-like disk, about as long as the petals, more or less subulate; anther 0.75 mm. long, basifixed, oblong, blunt at the apex; ovary epigynous, ovoidly globose, sessile, glabrous; style subterminal, very short and thick, somewhat crooked, terminated by a swollen stigmatic head. Fruits dark green, aragineous when ripe, juicy, sour, obovoidly oblong or subcylindric, upon slender 5 mm. long pedicels, subtended by the minute calyx, when dry somewhat flattened; solitary seed compressed, encased by a bony endocarp.

Type specimen number 13467, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, August, 1912; also *Elmer* 17913, in fruit from mount Maquiling. Forestry Bureau 26770 collected by *C. Mabesa* on this same mountain is in flower.

This genus is here for the first time reported from the Philippines.

Lepisanthes perviridis Elm. n. sp.

A small crooked tree, with rather coarse and few branches. Leaves alternate, 5 to 8 dm. long, evenly pinnate; rachis of leaves rigid, subterete, obscurely striate when dry, sordidly puberulent when young, ultimately glabrous, greenish; petiole very rigid and stout, glabrate; leaflets thinly chartaceous, also glabrous, green on both side but a trifle paler beneath, subopposite, upon 5 to 8 mm. long much thickened petiolules, the basal ones reduced, from 5 to 9 widely scattering pairs, the larger ones 3 dm. in length and 8 cm. in width, narrowly oblong, those af the base ovately oblong, acuminate, base broadly obtuse, entire; midrib much raised on the under side, straw brown, smooth, with 10 to 15 pairs of prominent ascending nerves whose ends are strongly upwardly curved, reticulations coarse and quite evident. Infrutescence axillary, up to 2 dm. in length, dirty brown pubescent, alternately and divaricately branched from near the base; the lower branches longer than the upper ones, all relatively short, unbranched and fruit or at least flower bearing throughout; flowers irregularly scattered from all sides of the spike, subsessile, subtended by persistent hairy bracts; calyx composed of 5 rotund segments, grayish tomentose except the membranous margins, 3 mm. long. Fruit dark velvety brown or felt covered, usually 2-seeded and didymous, 2 cm. across, occasionally 1-seeded and nearly globose, very short pedicelled, subtended by the small calyx; exocarp thin and apparently dry, the partition membranous; seed plano-convex, 8 mm. wide, shining and brown.

Type specimen number 18355, *A. D. E. Elmer*, Los Baños (Mt. Maquiling), Province of Laguna, Luzon, June-July, 1917. In dry or well drained forests of low altitude.

Bureau of Science number 12492 determined by *Dr. Radlkofer* as his *Lepisanthes eriolepis* has cinnamon brown fruits which are twice as large and nearly always globose, not didymous.

SAPOTACEAE

Palaquium montana Elm. n. sp.

A gnarly tree. Main branches crooked; the twigs relatively short and rigid, 8 to 18 cm. thick, roughened by the old leaf scars, terminated by a crown of stout sharply acuminate brown 1 cm. long bracts. Leaves alternatingly crowded from the ends of the branchlets, upon stout brown 5 to 8 mm. long petioles, rigidly coriaceous, lucid and dark green above, subacute to obtusely rounded, oblong or more often obovately oblong, the larger ones 6 by 16 cm. but frequently smaller, somewhat narrowed toward the base which is obtusely rounded or subauriculate, lower side velvety brown or grayish when old; the stout midrib flat above and raised beneath, with about 10 conspicuous nerves on each side. Flowers usually few clustered from the lower leaf axils; pedicels coriaceous, 2 to 3 cm. long, smooth and yellowish brown; calyx broadly cup shaped, 7.5 mm. wide, 5 mm. long, glabrous, with 6 equal segments arranged in 2 series, the outer 3 thick and obtuse at the apex, the inner or alternating 3 thinner and broadly rounded at the apex, all united at the base and brownish on the outer exposed side; petals nearly twice as long as the calyx, imbricate, obovately oblong, obtuse or obtusely rounded at the apex, narrowed toward the base or subclawed, 4 mm. wide, coriaceous, glabrous; stamens 10 to 12, erect, crowded, upon 2 to 3 mm. long coriaceous filaments; anther at least as long as the filament, large, compressed, ovately elongated, auriculately bilobed at the basifixed base, the connective thick and extended into a minute point, laterally dehiscent, 1 mm. wide; ovary glabrous, ovoidly globose; style thick, up to 1 cm. long, terminated by a minute capitate stigma. Fruit subtended by the persistent calyx, ellipsoid or ovately so, 3.5 cm. long by 2 cm. thick, rounded at both ends, green and scurfy brown at the apex, solitary or in pairs from the lower leaf axils or from the axils of their scars.

Type specimen number 17189, *A. D. E. Elmer*, Los Baños (Mt. Maquiling), Province of Laguna, Luzon, June-July, 1917. Number 2872, *C. F. Baker*, from this same summit region is the identical species in flower.

Different from *Palaquium latifolium Blco.* in leaf and fruit characters.

VITACEAE

Leea pauciflora Elm. n. sp.

A shrub 3 to 5 m. high, with few main branches. Twigs crooked, rather thin, more or less lenticelled, glabrous. Leaves alternate, the petiole and rachis slender, the former with a blunt interaxillary stipule and deeply grooved along the uper side except at the end, glabrous, coriaceous, imparipinnate, 2 dm. long, 5 to 7-foliolate, ovately oblong, the broadly obtuse or rounded base entire, otherwise coarsely serrate, acuminate to caudate, upon 5 to 8 mm. long petiolules except the terminal one which is 2 cm. in length, opposite, well scattered, equal in size except the basal or smaller ones, 3 by 9 cm., slightly paler beneath, drying blackish brown, the midrib with 5 to 7 pairs of obscure lateral nerves.

Inflorescence erect, terminal and leaf opposed, glabrous, about 5 cm. long, with few short branches above the middle; flowers yellowish, few clustered terminally, sessile; calyx unequally 5 toothed, turbinate, short and thick stipitate, 5 mm. long; corolla about as long, inserted upon the inner base of the calyx, the basal one third united, the broadly 4-lobed segments reflexed; stamineal column short, the 4 segments emarginate at the apex; anthers alternating, inflexed; pistil also glabrous. Infrutescence becoming much elongated, 5 or more cm. long, nearly as wide, corymbosely few branched, the relatively slender branches bearing few fruits toward their ends, glabrous and when dry murinous; pedicels 5 mm. long, comparatively thick; fruits 1.25 cm. wide, compressed globose when fresh, 4 rugose, glabrous, yellowish brown, subtended by an obscurely 4-toothed calyx, normally with 4 trigonous seeds.

Type specimen number 18092, *A. D. E. Elmer*, Los Baños (Mt. Maquiling), Province of Laguna, Luzon, June-July, 1917. Collected on nearly precipitous wooded slopes of the socalled crater.

Much resembling *Leea philippinensis Merr.* though much finer in all respects,

Leea luzonensis Elm. n. sp.

A very slender tree-like shrub. Stem 5 cm. thick, few branched toward the top. Leaves alternate, few toward the end of the thick branches, up to a meter in length, triangular in outline, decompound, subcoriaceous, glabrous, much paler green beneath and curing much lighter brown; petioles and rachis terete, swollen and articulate at the base and at the branching points; leaflets opposite as well as the branchlets, odd pinnate, from 5 to 9 along each of the main branches, varying from ovate to narrowly elongated, the basal pair 8 cm. long by 3 cm. wide, the terminal blades 2 dm. long by 5 cm. wide below the middle, broadly obtuse to rounded at the entire base, sharply acute to subcaudate, the margins irregularly serrate, the lower petiolules 5 mm. long, that of the terminal leaflet up to 5 cm. in length; midrib prominent beneath, the larger leaves with about 10 ascending pairs of nerves, the lower leaves with only one half as many lateral nerves, reticulations evident. Inflorescence corymbosely paniculate, terminal or subopposite the uppermost leaf, the average ones 15 cm. long and about as widely branched from below the middle, the stout peduncle roughened by lenticels; secondary peduncles com pressed or triangular, the ultimate branchlets short and flattened at the point of branching and brownish pulverulent; fruiting pedicels short, thick, somewhat scurfy brown; flowers rigid, erect, red except the yellowish white petals and stamens. Fruits much compressed, 1 cm. across, obscurely 6-rugose or more often very irregular, glabrous or minutely scurfy, subtended by 5-lobed persistent calyx segments, containing from 1 to 5 trigonous shining brown seeds.

Type specimen number 17776, *A. D. E. Elmer*, Los Baños (Mt. Maquiling), Province of Laguna, Luzon, June-July, 1917. Scattered in the forests at middle elevations or toward the boiling mud spring.

Larger or terminal leaflets different in shape and serrature from *Leea negrosensis Elm.* Quite distinct from *Leea manillensis Walp.* of the parang formation.

ERRATA

P. 2730, l. 2 from top for **gitingense** read **gitingensis**
P. 2734, l. 14 from bottom for 11262 read 1162
P. 2738, l. 15 from bottom for *Mucuuna* read *Mucuna*
P. 2741, l. 10 from bottom for Distinguish read Distinguished
P. 2746. l. 16 from top for **laxa** read **laxum**
P. 2752, l. 3 from bottom for **Abelmoschos todayense** read **Abelmoschus todayensis**
P. 2768, l. 8 from bottom for **surigaoense** read **surigaoensis**
P. 2785, l. 15 from bottom for *philippinensis DC.* read *philippinensis* (*DC.*) *Mez*
P. 2789, l. 5 from top or "**Platea apoensis Elm.** n. sp." should be placed under ICACINACEA
P. 2821, l. 9 from bottom for **apoensis** read **apoense**
P. 2826, l. 4 from bottom for **philippinense** read **philippinensis**
P. 2833, l. 10 from bottom for **apoense** read **apoensis**
P. 2837, l. 16 from top for **urdanetense** read **urdanetensis**
P. 2855, l. 17 from bottom for **umbrinus** read **umbrinum**
P. 2868, l. 10 from bottom for **mindanaense** read **mindanaensis**
P. 2878, l. 9 from bottom for **apoense** read **apoensis**
P. 2885, l. 1 from top for **alpinum** read **alpina**
P. 2913, l. 13 from bottom for **diversifolium** read **diversifolia**
P. 2916, l. 5 from top for **gigantifolium** read **giganfolia**
P. 2919, l. 1 from top for **sylvaticum** read **sylyatica**
P. 2945, l. 12 from top for *Damaenorops* read *Daemonorops*
P. 2947, l. 6 from top for **rodosticta** read **rhodosticta**
P. 2958, l. 15 from bottom for **Renm** write **Rehm**
P. 2958, l. 1 from top for *Perkiam* read *Parkiam*
P. 2963, l. 3 from top for **gigantifolium** read **gigantifolia**
P. 2972, l. 16 from bottom for sectiou read section

P. 2983, l. 18 from top for **peninsula** read **peninsularis**

P. 2990, ll. 15 and 16 from top for **Vanoverbergia** read **Vanoverberghia**

P. 2991, l. 3 from top for *Vanoverbergia* read *Vanoverberghia*

P. 2992, l. 16 from top for **magnum** read **magna**

P. 2993, l. 18 from bottom for turing read turning

P. 3026, l. 20 from bottom for chaped read shaped

P. 3027, l. 17 from bottom for lenth read length

P. 3083, l. 12 from bottom eliminate "*M.*" from *C. M. Mabesa*

P. 3087, l. 2 from top for **Em.** read **Elm.**

P. 3092, l. 21 from top for Lampur write Lumpur

P. 3100, l. 13 from bottom for Auguste read August

P. 3100, l. 12 from bottom for **Kobb** read **Kobbe**

INDEX

Abelmoschus haenkeanus 2754
Abelmoschus todayensis 3107, 2752
Acanthostigma bambusae 2951
Acerbia culmigena 2954
Acerbia maydis 2953
Actinorhytis calapparia 3010
Adelmeria albidum 2964
Adelmeria alpinum 2885
Adelmeria gigantifolium 2963
Adelmeria gigantifolium 2965
Adinandra apoense 2833
Adinandra elliptica 2837
Adinandra loheri 2836
Adinandra merrillii 2834
Adinandra montana 2838
Adinandra robinsonii 2836
Adinandra urdanetense 2837
Alchornea rugosa 2942
Alpinia apoensis 2888
Alpinia congesta 2968
Alpinia copelandii 2894
Alpinia cumingii 2890
Alpinia diversifolia 2991
Alpinia elegans 2966
Alpinia elegans 2969
Alpinia flabellata 2966, 2967, 2971, 2891
Alpinia flabellata major 2971
Alpinia foxworthyi 2887
Alpinia graminea 2966
Alpinia haenkei 2894
Alpinia haenkei 2967
Alpinia illustris 2894
Alpinia longipetiolata 2969
Alpinia pendula 2991
Alpinia pubiflora 2965
Alpinia pyramidata 2967
Alpinia romblonensis 2889
Alpinia rosea 2890
Alpinia rosea 2992
Alpinia rufa 2887, 2968
Alpinia sibuyanensis 2891
Alpinia subfusicarpa 2892
Alpinia trachyascus 2894
Alpinia vulcanica 2971
Alsodeia dubia 2875
Amaracarpus apoense 2804
Amaracarpus brauniana 2805
Amaracarpus microphylla 2805
Amomum bulusanense 2973
Amomum conoideum 2972
Amomum conoideum 2973
Amomum deuteramomum 2895, 2976, 2977
Amomum fusiforme 2794
Amomum lepicarpa 2092, 2979, 2988
Amomum lepicarpa pubescens 2979
Amomum linearifolia 2975
Amomum lophophora 2973
Amomum loheri 2898, 2976
Amomum luzonense 2976
Amomum mindanaense 2894
Amomum muricarpum 2980
Amomum muricarpum 2896
Amomum palawanense 2895
Amomum palawanense 2897
Amomum pandanicarpum 2900, 2979
Amomum pandanicarpum 8992
Amomum propinquium 2894, 2897, 2979, 2980
Amomum propinquium 2894
Amomum pubimarginatum 2974
Amomum pubimarginatum 2900
Amomum trilobum 2976
Amomum warburgii 2902, 2976
Amphisphaeria schizostachyi 2947
Amphisphaeria arengae 2947
Anthostoma eumorphum 2940

Anthostomella arecae 2938
Anthostomella arengae 2940
Anthostomella bahiensis 2939
Anthostomella calami 2939
Anthostomella donacina arengae 2940
Anthostomella coryphae 2940
Anthostomella coryphae minutissima 2940
Anthostomella eumorpha 2940
Anthostomella grandispora 2939
Anthostomella micraspis 2938
Anthostomella micraspis 2938
Anthostomella mindorensis 2940
Anthostomella mirabilis 2939
Anthostomella mirabilis discophora 2939
Anthostomella mirabilis schizostachya 2939
Anthostomella pandani 2939
Anthostomella uberiformis 2937
Antidesma fusicarpum 3081
Antidesma rostratum 3082
Antidesma subcordatum glabrifolium 3082
Apiospora apiospora 2946
Apiospora carbonaceae 2945
Apiosporella aberrans 2946
Ardisia cuprea 2777
Ardisia curtiflora 2778
Ardisia disticha 2778
Areca caliso 2998
Areca caliso 3000
Areca catechu 2997
Areca catechu 3938, 2998
Areca catechu humilis 2998
Areca ipot 2998
Areca whitfordii 2997
Arenga ambong 3023
Arenga mindorensis 3021
Arenga mindorensis 2940, 2927
Arenga saccharifera 3021
Arenga saccharifera 2936, 2945, 2950
Arenga tremula 3022
Artocarpus communis 2932
Artocarpus incisa 2932
Asterina crustacea 2931
Astronia cumingiana 3093
Astronia foxworthyi 3091
Astronia maquilingensis 3092
Astronia merrillii 3091
Astronia piperi 3091
Astronia viridifolia 3092
Ascospora ophiorrhizae 2935
Ascospora vanillae 2935
Auerswaldia arengae 2939, 2940
Auerswaldia decipiens 2940
Auerswaldia pandani 2939
Avicenia alba 2869
Avicenia mindanaense 2868

Bambusa blumeana 2928, 2951, 2952, 2960
Bambusa vulgaris 2930, 2937, 2944, 2946, 2948, 2956
Barringtonia gitingense 2730
Barringtonia revoluta 2731
Barringtonia sumatrana 2731
Beilschmedia trinervia 2721
Briardia lutescens 2927
Briardia maquilingiana 2927
Briardia roseolutescens 2927
Broomella zeae 2933

Calamus bicolor 3055
Calamus blancoi 3048
Calamus cumingianus 3050
Calamus cumingianus 3051
Calamus dimorphacanthus 3055
Calamus discolor 3048
Calamus elmerianus 3051
Calamus filispadix 3048
Calamus manillensis 3052
Calamus manillensis 3061
Calamus megaphyllus 3060

Calamus melanorhynchus 3058
Calamus merrillii 3057
Calamus merrillii merrittianus 3057
Calamus merrillii nanga 3057
Calamus microcarpus 3056
Calamus microcarpus 3055
Calamus mollis 3046
Calamus mollis palawanicus 3047
Calamus moseleyanus 3053
Calamus multinervis 3060
Calamus multinervis 3064
Calamus ornatus philippinensis 3054
Calamus samian 3059
Calamus siphonospathus 3056
Calamus symphysipus 3049
Calamus symphysipus 3051
Calamus vinosus 3061
Calamus viridissimus 3059
Callicarpa attenuifolia 2870
Callicarpa epiphytica 2871
Callicarpa flavida 2873
Calonectria hibiscicola 2923
Calonectria meliae 2923
Calonectria sulcata 2923
Capparis horrida 2949
Capparis oblongata 3076
Capparis viridis 3076
Caryota mitis 3020
Caryota tremula 3022
Caryota tremula 3022
Caryota rumphiana 3020
Caryota rumphiana philippinensis 3019
Casearia trivalvis 3083
Casearia zschokkei 3083
Celtis mindanaensis 2842
Celtis philippinensis 2843
Cenangium blumeanum 2927
Cenangium helvolum 2928
Centhocarpum depokense 2953
Centhocarpum depokense 2953
Centhocarpum talaumae 2953
Centotheca latifolia 2924
Christisonia wightii 2793
Cissus apoensis 2880
Citrus nobilis 2950
Clausena todayensis 2805
Clypeosphaeria bakeriana 2948
Clypeosphaeria euphorbicolae 2949
Coccomyces dubius 2926
Coccomyces quadratus philippinus 2926
Conocephalus piperi 2770
Conocephalus violascens 2772
Corypha elata 3023
Corypha elata 2940
Corynelia clavata 2925
Costus speciosus 2977
Cratoxylon arboreum 3084
Cratoxylon celebicum 3085
Creochiton rosea 2756
Cryptocarya calelanensis 2720
Cryptocarya glauciphylla 2720
Cryptocarya intermedia 2719
Cryptocarya laevigata 2720
Cryptocarya laurifolia 2722
Cryptocarya luzonensis 2722
Cryptocarya mindanaensis 2721
Cryptocarya palawanensis 2720
Curcuma zeodaeria 2977
Cynometra bijuga 2736
Cynometra copelandii 2734
Cynometra whitfordii 2734
Cyrtandra lagunae 3084
Cyrtandra maquilingensis 3083

Daemonorops affinis 3042
Daemonorops curranii 3033

Daemonorops curranii 3040, 3942
Daemonorops gaudichaudii 3031
Daemonorops gaudichaudii 3044
Daemonorops gracilis 3044
Daemonorops hystrix 3042 3046
Daemonorops lamprolepis 3035 3040, 3042
Daemonorops manillensis 3052
Daemonorops margaritae palawanicus 3030
Daemonorops ochrolepis 3032
Daemonorops oligolepis 3037 3039, 3040
Daemonorops oligolepis 3035
Daemonorops pannosus 3033
Daemonorops pannosus 3037 3039, 3040
Daemonorops pedicellaris 3042
Daemonorops pedicellaris 3040
Daemonorops urdanetanus 3038
Daemonorops urdanetanus 3039
Dalbergia dubia 2731
Dalbergia millettii 2732
Dalbergia pinnata 2732
Dalbergia tamarindifolia 2732
Debregeasia angustifolium 2845
Debregeasia luteocarpa 2843
Dedea apoense 2825
Dedea cinerea 2824
Derris canescens 3087
Derris cumingii 3087
Derris micans 2734
Derris mindorensis 2734
Derris philippinensis 2928, 2734
Derris surigaoensis 2733
Desmos elegans 3070
Didymella eutypoides 2943
Didymella eutypoides 2943
Didymella orchnodes 2943
Didymella maculosa 2943
Didymella seriata 2943
Didymosphaeria inconspicua 2948
Didymosphaeria striatula 2948
Dillenia reifferscheidia rosea 3079
Dillenia reiffercheidia 3080
Dimerocalyx longipes 2930
Discocalyx congestiflora 2780
Discocalyx longifolia 2781
Discocalyx macrocarpa 2781
Discocalyx montana 2781
Dissochaeta celebica 2756
Dissochaeta furfurascens 2754
Donax cannaeformis 2945
Dothidea thanatospora 2924
Dracontomelum cumingiana 2953
Dysoxylum cumingianum 3093
Dysoxylum testaceus 3093

Elaeocarpus gitingensis 3981
Elaeocarpus maquilingensis 3080
Elatostema agusanense 2845
Elatostema agusanense 2847
Elatostema antonii 2847
Elatostema camiguinense 2849
Elatostema caranoi 2858
Elatostema gitingense 2852
Elatostema integrifolia 2855
Elatostema laciniatum 2862
Elatostema longifolium 2846 2847
Elatostema lutescens 2850
Elatostema pictum 2850
Elatostema sessile 2853
Elatostema surigaoense 2854

Elatostema umbrinus 2847
Elatostema umbrinus 2855
Elatostema urdanetense 2857
Elatostema urdanetense 2847
Elatostema variabile 2856
Elatostema viridescens 2850
Elatostematoides laxum 2860
Elatostematoides sublaxum 2858
Embelia urdanetensis 2783
Embelia whitfordii 2784
Erycibe copelandii 3077
Erythropalum grandifolium 2788
Erythropalum scandens 2789, 2747
Eucalyptus binacag 2776
Eugenia abbreviata 2776
Eugenia agusanensis 3096
Eugenia alvarezii 3697
Eugenia bataanensis 2949, 2951
Eugenia benthami 3097
Eugenia binacag 2776
Eugenia densinervia 3095
Eugenia maquilingensis 3096
Eugenia parva 2777
Eugenia perpallida 2777
Eugenia roseo-marginata 3097
Eugenia rubrovenia 3096
Eugenia sablanense 3095
Eugenia silvestrei 3095
Eugenia subsulcata 3095
Eutypella arundinarieae 2956
Eutypella bambusinae 2956
Eutypella lineolata 2955
Eutypella malloti 2955
Eutypella malloti 2955
Eutypella plagia 2955
Evodia arborea 2806
Evodia benguetensis 2808
Evodia dubia 2809
Evodia glabrum 2808
Evodia retusa 2809
Evodia semicarpifolia 2808
Fagraea auriculata 2744, 2746
Fagraea congestiflora 2741
Fagraea epiphytica 2743
Fagraea jackii 2744
Fagraea nonok 2746
Fagraea racemosa 2743
Ficus cuernosensis 3095
Ficus maquilingensis 3094
Ficus minahassae 2923
Ficus pseudopalma 2926
Freycinetia banahaensis 3098
Freycinetia rigida 3098
Freycinetia robusta 3097
Freycinetia subflagellata 3098

Geniostoma cumingianum 2747
Geniostoma laxa 2747
Geniostoma mindanaense 2747
Gibbera borneensis 2946
Gibbera philippinensis 2946
Gigantochloa scribneriana 2929
Gleditschia copelandii 2734
Gliricidia sepium 2922
Globba aurea 2902
Globba brevifolia 2903
Globba gracilis 2903
Globba parviflora 2977
Globba ustulata 2903
Glochidion canescens 3082
Glochidion molle 3082
Gomphostemma cinerea 3086
Gomphostemma philippinarum 3086
Gouania microcarpa subglabra 2801
Gouania microcarpa 2802
Grewia pyriformis 2841
Grewia stylocarpa 2949, 2842
Guignardia bambusina 2936
Guignardia dinachloae 2936
Guignardia humuline 2936
Gymnacranthera laxa 2772
Gymnacranthera paniculata 2773

Gymnacranthera urdanetensis 2773

Harrisonia citrinaecarpa 2828
Harrisonia perforata 2830
Hedychium coronarium 2978
Hedychium coronarium 2903
Hedychium mindanaense 2904, 2978
Hedychium mindanaense 2978
Hedychium philippinense 2903
Hedychium philippinense 2905, 2978
Helicia integra 2800
Helicia integrifolia 2798
Heterospathe elata 3013
Heterospathe elata 3016
Heterospathe elmeri 3010
Heterospathe negrosensis 3014
Heterospathe philippinensis 3013
Heterospathe sibuyanensis 3014
Heterostemma herbertii 3074
Hibiscus rosa-sinensis 2950
Hiptage lawsonii 2751
Hornstedtia conoidea 2972, 2973
Hornstedtia dalican 2906
Hornstedtia dalican 2900
Hornstedtia irosinensis 2981
Hornstedtia irosinensis 2984
Hornstedtia lepicarpa 2988
Hornstedtia lepicarpa 2799
Hornstedtia lophophora 2973
Hornstedtia luzonensis 2983
Hornstedtia microcheila 2983
Hornstedtia muricarpa 2980
Hornstedtia pandanicarpa 2979
Hornstedtia pandanicarpa 2985, 2987
Hornstedtia peninsularis 2983
Hornstedtia philippinensis 2980, 2905
Hornstedtia philippinensis 2980, 2894, 2897
Hornstedtia propinqua 2979
Hornstedtia propinqua 2980
Hornstedtia pubescens 2979
Hornstedtia purpurea 2984
Hornstedtia sorsogonensis 2985
Hornstedtia sorsogonensis 2987
Hornstedtia subviridis 2987
Hoya luzonica 2937
Humaria caballina 2930
Humaria guanici 2930
Humaria merdarian 2930
Hydrangea cuneatifolia 2825
Hydrangea glandulosa 2826
Hypoxylina philippinensis 2921
Hypoxylon annulatum 2957
Hypoxylon culmorum 2960
Hypoxylon freycinetiae 2959
Hypoxylon heamatostroma 2958
Hypoxylon granulosum 2958
Hypoxylon marginatum 2958
Hypoxylon marginatum mammiforme 2958
Hypoxylon rubigineo-aerolatum microsporum 2958
Hypoxylon subeffusum 2958
Hysterystomella spurcaria 2932

Ilex apoensis 3071
Ilex apoensis punctata 3071
Ilex hanceana 3071
Ilex pulogensis 3071

Imperata cylindrica 2956
Imperata exaltata 2942

Jasminum apoense 2791
Jasminum crassifolium 2792, 2793
Jasminum rotundifolium 2792
Jasminum trinervium 2792

Kadsura apoensis 2748
Kadsura scandens 2750, 2751
Kadsura sulphurea 2750
Korthalsia laciniosa 3029

Laestadia traversi 2935
Lagerheima dermatoidea 2928
Lagerstroemia speciosa 2926
Laportea agusanensis 2860
Lasiosphaeria culmorum 2952
Lasiosphaeria mollis 2952
Leea agusanensis 2881
Leea congesta 2883
Leea luzonensis 3104
Leea manilensis 3105
Leea negrosensis 3105
Leea pauciflora 3103
Leea philippinensis 3104
Lembosia cocoes 2932
Lembosia crustacea 2931
Lembosia congregata 2931
Lembosia eugeniae 2932
Lembosia javanica 2933
Lembosia pandani 2932
Lepisanthes eriolepis 3102
Lepisanthes perviridis 3101
Leptoselena insignis 2907
Leptosphaeria orthogramma 2951
Leucaena glauca 2923
Linospora elasticae 2954
Linospora pandani 2954
Linospora seriata 2954
Litsea albayana 2726
Litsea caesifolia 2726
Litsea bicolor 2722
Litsea gigantifolia 2724
Litsea macrophylla 3723
Litsea oblongifolia 2726
Litsea urdanetensis 2724
Litsea velutina 2726
Livistona rotundifolia 3025
Livistona rotundifolia microcarpa 3024
Livistona rotundifolia luzonensis 3025
Lophodermium aleuritis 2925
Lophodermium arundinaceum 2925
Lophodermium arundinaceum vulgare 2926
Lophodermium planchoniae 2925
Loranthus estipitatus 3089

Mallotus philippinensis 2954
Marchalia spurcaria 2932
Massalongiella imperatae 2956
Massalongiella smilacis 2956
Massaria bataanensis 2951
Massaria ulmi 3951
Massarinula bambusincola 2944
Massarinula donacina 2944
Medinilla antonii 2756
Medinilla duodecandra 2758
Medinilla rotundifolia 2757
Melanomma mindorense 2950
Melanopsamma lichenoides 2944
Melanopsamma salicaria 2944
Malastoma holmani 3089
Melastoma molle 2760
Melastoma pennicillatum 2760
Melastoma polyanthum 3090
Melastoma setosum 2758
Melicope mindanaensis 2809
Melicope monophylla 2810
Melicope monophylla glabra 2810
Melicope monophylla glabra 2810

Meliosma tongcalingii 2815
Meliola maesae 2924
Meliola panicae 2924
Memecylon agusanense 2760
Memecylon apoense 2765
Memecylon densiflorum 2762
Memecylon gitingense 2762
Memecylon gigantifolium 2762
Memecylon odoratum 2762
Memecylon palawanense 2762
Memecylon urdanetense 2764
Merrilleopeltis calami 2945
Merrilleopeltis daemonoropsis 2945
Merrilleopeltis hoehnelii 2945
Metasphaeria corruscans 2949
Metasphaeria dispar 2950
Metasphaeria incompleta 2949
Metasphaeria hibiscincola 2950
Metasphaeria maculans 2950
Metasphaeria papulosa 2950
Metroxylon rumphii 3026
Mimusops elengi 2816
Mimusops latericia 2816
Miscanthus japonicus 2926
Morenoella breviscula 2931
Morenoella gedeana 2931
Mucuna longipedunculata 2738
Mucuna macmillani 2736
Murraya banati 2812
Murraya elongata 2813
Murraya exotica 2813
Myristica agusanensis 2755
Myristica agusanensis 2775
Myristica cumingii 2755, 2776

Naravelia antonii 2800
Naravelia uncinata 2801
Nectria bulbophylli 2923
Nectria discophora 2922
Nectria flavido-carnea 2922
Nectria leucaenae 2923
Nectria pityrodes 2922
Nectria striatospora 2922
Nectria subfurfuracea 2922
Nectria subcoccinea 2923
Nectria theobromae 2922
Nectria tijibodensis 2922
Nelumbium nelumbo 3080
Nelumbium speciosum 2908
Neonauclea barnardoi 3100
Neonauclea calycina 3100
Neonauclea kobbei 3100
Neopeckia diffusa 2947
Neopeckia nobilis 2947
Neopeckia rhodosticta 2946
Neopeckia rhodosticta magnifica 2947
Nepenthes merrillii 2787
Nepenthes surigaoensis 2785
Nepenthes truncata 2787
Nipa fruticans 2933
Niptera grewiae 2928
Nitschkea bambusarum 2956
Nitschkea recedens 2956
Normanbya merrillii 3009
Nummularia citrincola 2961
Nummularia diatrypeoides 2960
Nummularia fragilliam 2959
Nummularia lianae 2959
Nummularia memorabilis 2960
Nummularia minuta 2960
Nummularia reyesiana 2960
Nummularia scutata 2961

Oncosperma filamentosa 3016
Oncosperma gracilipes 3017
Oncosperma horrida 3017
Ophiobolus javanicus 2954
Ophiobolus seriatus 2954
Ophiodothis thanatospora 2924
Orania decipiens montana 3018
Orania philippinensis

sibuyanensis 3017
Palaquium cuprifolium 2817
Palaquium gigantifolium 2819 2820
Palaquium latifolium 3103
Palaquium montana 3102
Palaquium pinnatinervium 2819
Pandanus sabutan 2947, 2954
Pandanus utilissimus 2954
Papualthia bakeri 3069
Papualthia flava 3070
Papualthia loheri 3070
Papualthia lanceolata 3070
Paranectria luxurians 2924
Parkia timoriana 2958
Parmularia javanica 2933
Parsonsia confusa 3072
Parsonsia magnifolia 3071
Payena fusicarpa 2820
Pellionia laciniata 2862
Pellionia laciniata 2863
Pellionia sinuata 2863
Pellionia sordida 2862
Pegia philippinensis 3100
Persea leytensis 2729
Persea pyriformis 2727
Persea surigaoensis 2728
Peziza phyllogena 2931
Pezizella ombrophilacea 2929
Phaeomeria imperialis 2907
Phaeosphoerella donacina 2948
Phaleria axillaris 2840
Phaleria cumingii 2841
Phomatospora migrans 2936
Photinia urdanetensis 2802
Physalospora bambusae 2937
Physalospora dinachloae 2937
Physalospora hoyae 2037
Physalospora peribambusina 2937
Physalospora vanillae 2935
Pinanga barnesii 3002
Pinanga copelandi 3002
Pinanga elmeri 3004
Pinanga insignis 3004
Pinanga insignis 3008
Pinanga negrosensis 3006
Pinanga philippinensis 3006
Pinanga philippinensis 3009
Pinanga rigida 3005
Pinanga sibuyanensis 3006
Pinanga speciosa 3005
Pinanga urdanetensis 3008
Pinanga woodiana 3003
Pittosporum odoratum 2796
Pittosporum subverticellatum 2795
Plagiostachys corrugata 2908
Plagiostachys escritorii 2910, 2989
Plagiostachys philippinensis 2989
Plagiostachys philippinensis 2912
Plagiostachys ridleyi 2911 2989
Planchonia spectabilis 2925
Platea apoensis 2789
Platea fuliginea 2890
Platea latifolia 2790
Plectocomia elmeri 3029
Plectronia mabesae 3099
Plicaria cateras 2931
Plicaria tropica 2931
Plicaria tropica 2931
Polycias nodosa 2958
Polygonum apoense 2796
Premna nauseosa 2875
Premna odorata 2948
Procris frutescens 2865
Procris frutescens nervosa 2863
Procris pseudostrigosa 2865
Procris urdanetensis 2865
Procris volubilis 2867
Propolidiopsis arengae 2927
Psidium guajava 2930

Ptychoraphis angusta 3013
Ptychoraphis elmeri 3010
Ptychoraphis intermedia 3011
Ptychoraphis intermedia 3013
Ptychoraphis microcarpa 3013
Ptychoraphis philippinensis 3014
Ptychoraphis singaporensis 3013

Rapanea glandulosa 2784
Rapanea philippinensis 2785
Rhaphidophora acuminata 3037
Rhaphidophora grandifolia 3074
Rhaphidophora lagunensis 3072
Rhaphidophora perkinsae 3073
Rhaphidophora stenophylla 3073
Rhaphidophora trinervia 3073
Rhipidocarpon javanicum 2933
Rhododendron schadenbergii 2931
Rhytisma constellatum 2932
Rhytisma lagerstroemiae 2926
Rhytisma pongamiae 2926
Rhytisma spurcarium 2932
Rinorea fasciculata minor 2877
Rosellinia bogoriensis 2942
Rosellinia bunodes 2941
Rosellinia crustaceae 2941
Rosellinia emergens 2942
Rosellinia horrida 2941
Rosellinia lamprostoma 2941
Rosellinia lamprostoma 2942
Rosellinia maquilingiana 2942
Rosellinia molleriana 2942
Rosellinia procera 2942
Rosellinia pulveraceae 2942

Schneepia javanica 2933
Sclerotinia nervisequia bambusacea 2930
Sideroxylon angustifolium 2824
Sideroxylon apoense 2821
Sideroxylon urdanetense 2823
Smilax bracteata 2741
Smilax reticulata 2740
Smilax williamsii 2741
Solanum anisophyllum 2830
Solanum biflorum 2833
Solanum crassipetalum 2833
Solanum denticulatum 2833
Solanum lagunense 2832
Solanum mindanaense 2832
Sonerila lilacina 2765
Sonerila woodii 2767
Spatholobus gyrocarpus 3088
Spatholobus sanguineus 3087
Sphaeria bunodes 2941
Sphaeria micraspis 2938
Sphaeria orthogramma 2951
Spiraeopsis celebica 2828
Spiraeopsis philippinense 2826
Streblus asper 2942, 2957
Strongylodon agusanensis 2738
Strongylodon mindanaensis 2740
Strongylodon pulcher 2740

Talauma villariana 2953
Tetractomia majus 2815
Tetractomia philippinense 2813
Tetractomia roxburghii 2815
Thea reticulata 2838
Theobroma cacao 2922
Thomatospora migrans 2936
Thyridaria calamincola 2957
Thyridaria croscosareae 2957
Thyridaria eminens 2957
Toxocarpus loheri 3076
Toxocarpus rubricaulus 3075
Trematosphaeria fendlerae 2952
Trematosphaeria maquilingiana 2952

Trematosphaeria maquilingiana schizostachyi 2952
Trichobelonium melioloides 2929

Vanoverberghia diversifolium 2991
Vanoverberghia diversifolium 2913
Vanoverberghia sepulchrei 2990
Vavaea ardisioides 2767
Vavaea surigaoense 2768
Vernonia acuminatissima 3076
Vernonia urdanetensis 3077
Viola apoense 2878
Viscum loranthi 3089
Vitex curtifrutescens 2873
Vitex premnoides 2874

Wallichia oblongifolia 3023
Weinmannia luzoniensis 3079
Weinmannia luzoniensis puberula 3078

Xylaria tabacina 2961

Zalacca clemensiana 3028
Zea mays 2924, 2951
Zignoella lichenoides 2950
Zignoella nobilis 2950
Zingiber apoense 2914
Zingiber apoense 2919
Zingiber bulusanense 2993
Zingiber gigantifolium 2916
Zingiber gigantifolium 2963
Zingiber mollis 2919
Zingiber negrosense 2917
Zingiber officinale 2991
Zingiber sylvatica 2919, 2991
Zingiber zerumbet 2913, 2993
Zingiber zerumbet magnum 2992